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Forest Service

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Final Environmental Assessment

Upper Little Deschutes Restoration Project

Crescent Ranger District, Deschutes National Forest
Klamath County, Oregon

Township 24S, Range 8E, Sections 26, 32, 33, 34, 35 and Township 25S, R08E Sections 4, 5, 8, 17, 19, and 20, Willamette Meridian

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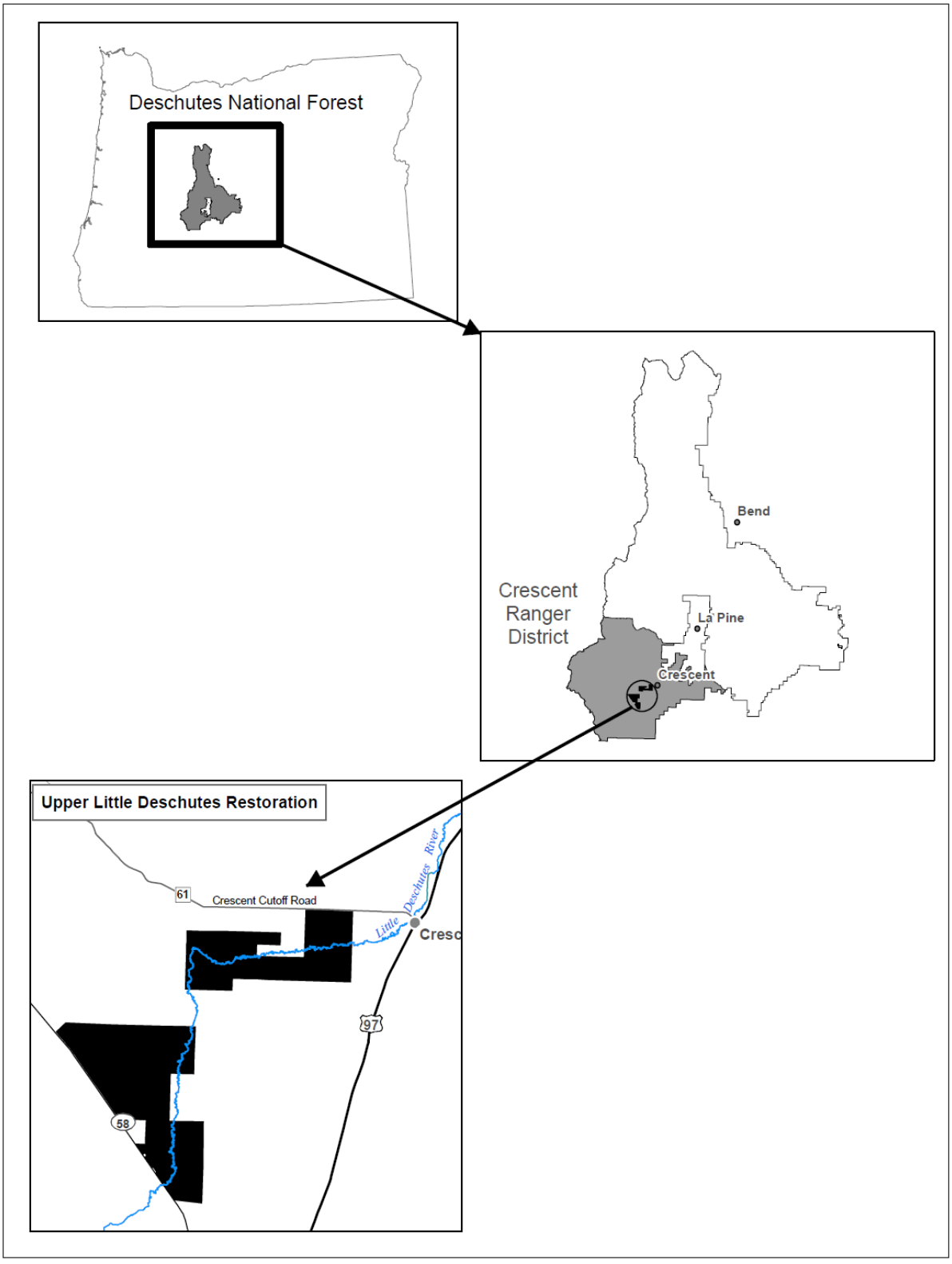

Figure 1. Upper Little Deschutes Restoration Vicinity Map

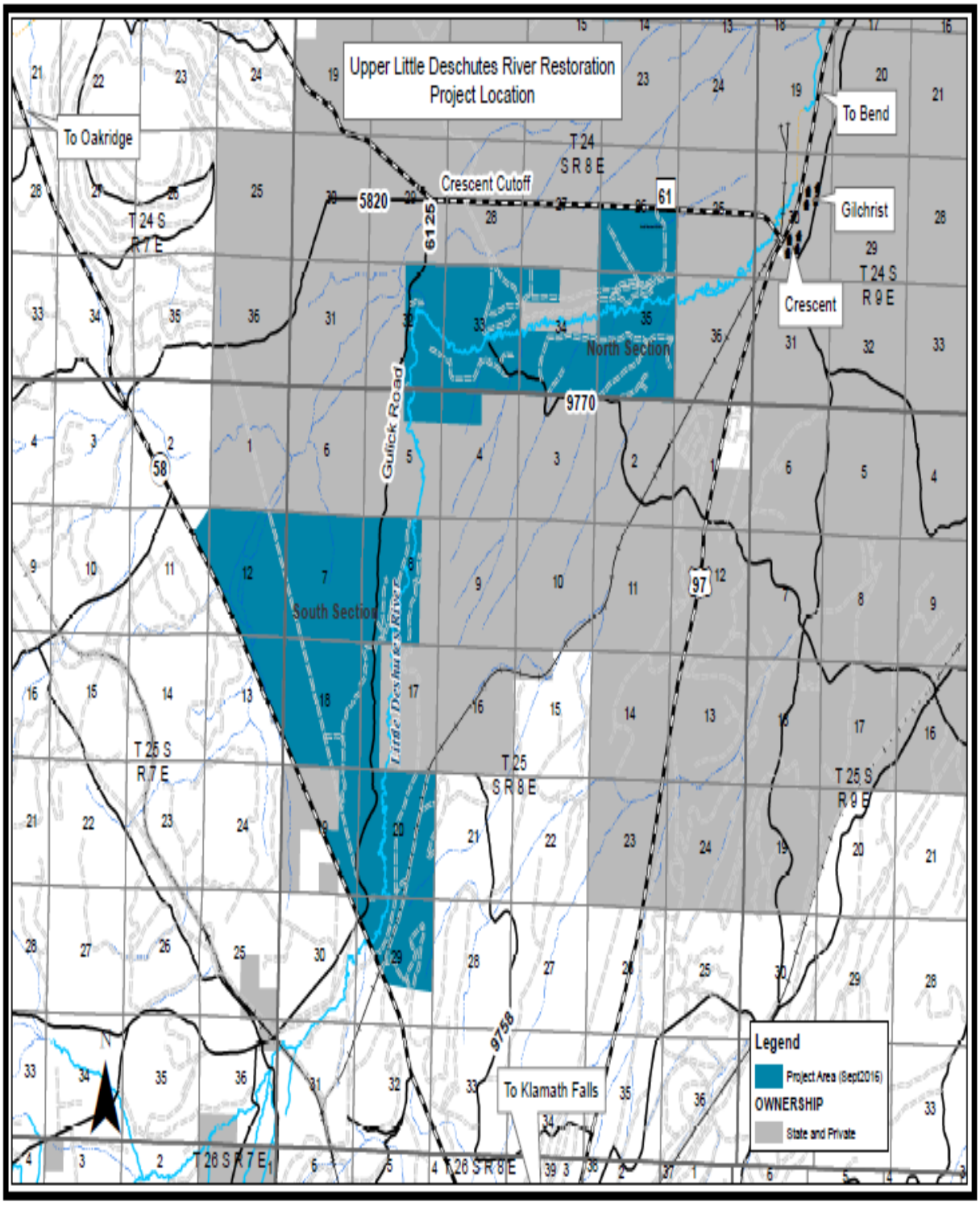

Figure 2. Upper Little Deschutes Restoration Project Area Location Map

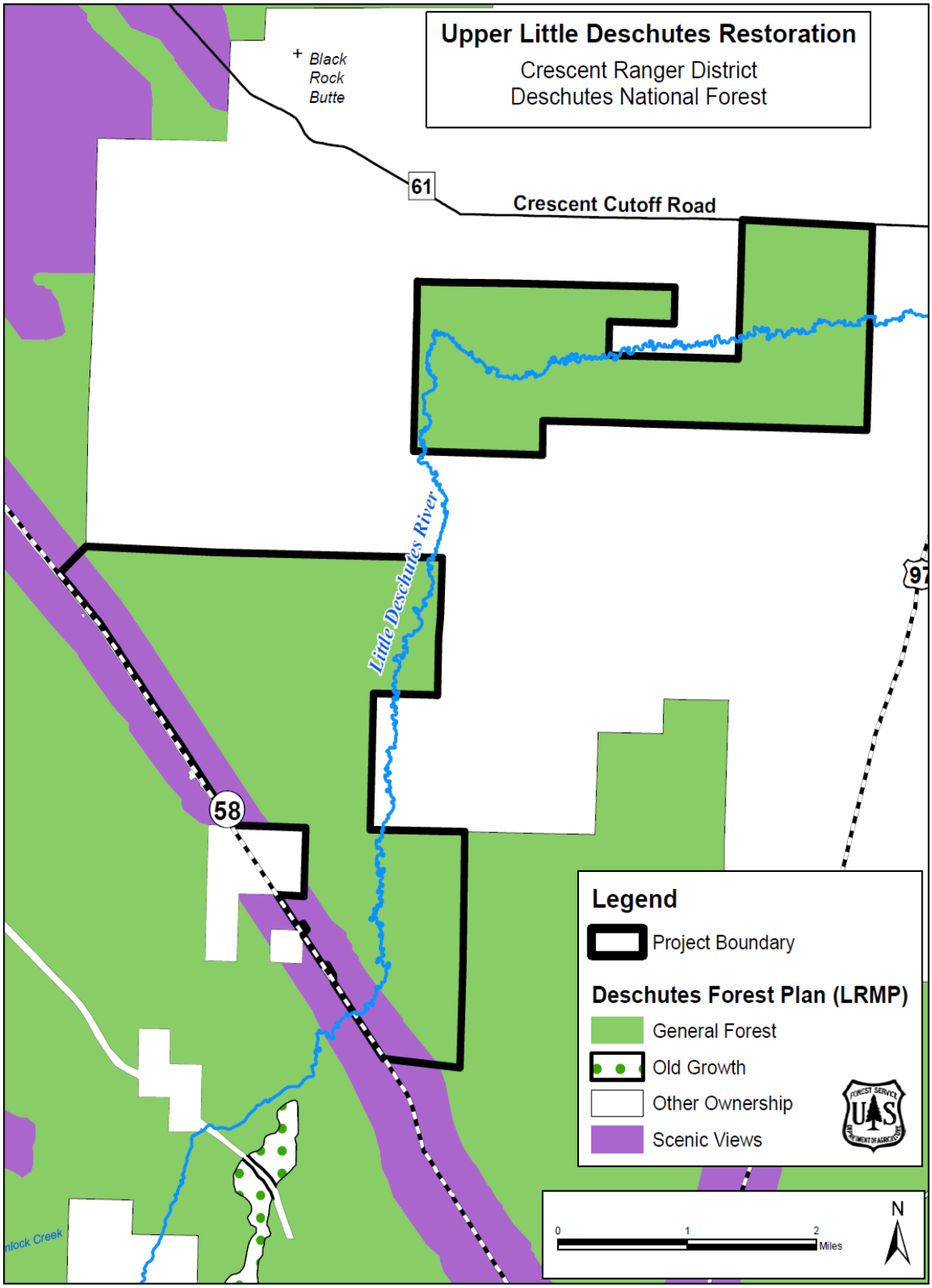

Figure 3. Deschutes Land and Resource Management Plan Management Allocations overlaid on the Upper Little Deschutes Restoration Project Area

CHAPTER ONE

Document Structure

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This environmental assessment focuses on what is relevant and important and concentrates on the issues that are truly significant to the action in question, rather than amassing needless detail (40 CFR 1500.1). Legal requirements are only to provide enough evidence to support our conclusions, address relevant environmental impacts and concentrate on whether the action would "significantly" affect the quality of the human environment. This Environmental Assessment (EA) discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives.

Therefore, this "focused" Environmental Assessment may not include topics that are not required in an environmental document but have historically been included. Topics that may have been eliminated are: project summary, NEPA process language, no action alternative (as long as no action is compared to impacts of the action alternative), exhaustive list of forest plan standard and guidelines, irreversible and irretrievable commitment section, and appendices.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Crescent Ranger District Office in Crescent, Oregon.

Background and Existing Condition

The Upper Little Deschutes Restoration project (ULDR) consists of two separate areas (6,286 acres) along the Little Deschutes River that are separated by private land. It includes a northern portion (also known as Odell Pasture, 2,491 acres), and the southern area (3,795 acres). The northern area is surrounded by private land and Forest Service access is off County Road 61 (also known as Crescent Cutoff road). The southern portion is adjacent to Highway 58 and partially bordered on the east side by private land. Forest Service road 6125 (Gulick road) traverses through this portion and the western edge of the northern portion of the project area. Both areas are heavily utilized by the local population for fishing, hunting, recreation, and access to private land adjacent to National Forest land.

The following portions of both the northern and southern sections were acquired in 1998 from the land exchange with Crown Pacific[1]. Northern section includes: Township 24S, R08E, Sections 32, 33, and 34; Township 25S, Range 08E, Sections 4 and 5. The southern portion included portions of Township 25S, Range 08E, Sections 7, 8, and 18.

In 2012, the Pete Timber Sale (2009 BLT EIS) completed small diameter thinning, thinning from below, and underburning on the northern section. However, the treatments did not address the lodgepole encroachment into the edges of the meadows, the possibility of improving the hydrologic functions, creating/expanding unique habitats for fish and the Oregon spotted frog by reconnecting relic oxbows, and closure of the unauthorized water diversion ditch.

The Deschutes National Forest Land and Resource Management Plan of 1990 (LRMP) as amended, provides guidance for management activities. The two portions are managed as "General Forest" and are east of the "owl line" thus the Northwest Forest Plan requirements do not apply. The LRMP

[1] USDA Forest Service Crown Pacific Limited Partnership, Land Exchange Project Final Environmental Impact Statement (EIS), February 1998.

establishes goals, objectives, standards, and guidelines for each specific management area of the Forest, as well as Forest-wide standard and guidelines. This area is managed under Management Area 8 (M8) General Forest where the goal is "*To emphasize timber production while providing forage production, visual quality, wildlife habitat, and recreational opportunities for public use and enjoyment."*

Management Allocation	**Acres**
Scenic View -Partial Retention Foreground	613
General Forest	5,673
Total Acres	**6,286**
Overlapping Riparian Reserves	**Acres**
Riparian	450
Wetland	624
Total Riparian Reserves	**1,074**

The goal of the Upper Little Deschutes Restoration project is restoration not timber production, as there are additional uses that General Forest can be managed for including the following standards and guidelines for Recreation:

- **M8-2** – *Traditional informal campsites, hunter camps, or areas where concentrated recreation use occurs will be recognized as being significant in producing and utilizing dispersed recreation opportunities. Prescriptions for harvesting, cleanup, site preparation, and thinning will consider the environmental setting that contributes to the attraction of these sites for recreation purposes. The attempt will be made to retain this attractive character during and after treatments.*

- **M8-3 –** *Recreation use can be discouraged or prohibited:*
  - *In areas where timber harvesting activities are occurring;*
  - *Where public safety is being threatened; and*
  - *Where resource damage from recreation activity is occurring or may occur.*

Dispersed camping has a high value for many visitors but unmanaged dispersed campsites, if left unchecked, will continue to expand and damage vegetation adjacent to the river. This expansion contributes to sedimentation, reduced plant and wildlife habitat, and impairs water quality and water storage (Table 1, Figure 4 and Figure 5).

There are two known illegal dumping sites on the northern portion of the planning area. This distracts from the scenic beauty and recreational enjoyment of others and creates a safety hazard from potential contamination.

- **M8-4** – *Generally, off-highway vehicle use is allowed. Closures and restrictions will be established where off road vehicle use will threaten or damage other resource values, such as plantations, soils, and wildlife….*

Only open Maintenance Level 2 (ML 2) roads or designated trails which appear on the Motor Vehicle Use Maps (MVUM) and the designated trail system from Three Trails OHV are open for OHV/ATV use on the Crescent Ranger District. The Three Trails OHV designated trail system does not encompass either section of the Upper Little Deschutes Restoration Project.

In both sections there is evidence of unauthorized cross-country travel that is creating riparian and resource damage (vehicle tracks in meadow and an unauthorized ATV bridge [Figure 4 and Figure 5] over the Little Deschutes River that are contributing to erosion and sedimentation in the river etc.).

In addition, there are several areas in both sections that have historical value. It is the intent of this project to protect them. There may be the opportunity to build interpretative kiosks/panels near some of these sites to promote educational opportunities in the future.

Figure 4. Damage to Meadow/Riparian Areas Adjacent to Little Deschutes River

Ecosystem Services

The project area is focusing on the Little Deschutes River and the unique habitat it provides for wildlife and fish. The area is important to many generations of the local community for a variety of reasons (hunting, fishing, solitude, recreation etc.). The Forest Service is approaching this project by looking at the environmental benefits that the project area provides, from recreational experiences for the public to wildlife habitat, and from water quality to scenic views.

The Ecosystem Services framework[2], used here, highlights the diversity of benefits currently being provided by the landscape (recreation and access to those recreation sites, unique habitat for aquatic species, water quality, hunting, and fishing opportunities etc.). The Forest Service needs and wants to manage for this full suite of benefits not only for the public but also focusing on hydrologic improvement for fish and the Oregon spotted frog. The goal of the project is to maintain or increase the net benefits that people receive from the project area currently and allow the area to continue to provide this diverse range of benefits into the future.

As the focus is on maintaining and improving the project area for the variety of environmental benefits that it provides for the public, we have relied on public participation to inform us and help us design the proposed action. A group of local citizens shared their thoughts for how the project area should be managed at a pre-NEPA public meeting on March 30, 2016.

The March 2016 public values meeting had public participants identify values of importance to them concerning this potential project area. These included recreation access to fishing and camping sites, through access across the western portion of Odell Pasture that ties into Forest Service road 6125 that could be utilized by ATVs and high clearance vehicles. Also identified were: hunting opportunities, high quality plant and animal habitat, clean-up of unauthorized dump sites, and more Field Ranger presence in the summer to enforce current dispersed camping limits. There were also several concerns from the private sector. One concern was that by reconnecting the oxbows and raising the water levels it could flood private property and threaten the private bridge that is the main access for a lot of the locals to their private residences. Another was the mention of historic sites that could be flooded with any raise in the water level.

Values that fed into the purpose and need include:

- Quality aquatic and terrestrial habitat to provide for fish, big game, beaver, Oregon spotted frogs, and a diversity of plant species
- Quality recreational experience of hunting, fishing, and camping, with a sustainable road system that provides access (including OHVs on ML2 roads) while increasing wildlife security and reduces sedimentation to the river.

Project Design Features would include provisions to protect flooding of private property, the private bridge, and historic sites.

What is not included in the proposed action is the development of new motorized and non-motorized trails. The public was predominately against adding trails, although there were some members that preferred additional OHV trails. Currently, open ML 2 roads or designated trails which appear on the Motor Vehicle Use Maps (MVUM) and/or the designated trail system from Three Trails OHV are open for ATV use on the Crescent Ranger District. The Three Trails OHV designated trail system does not encompass either section of the Upper Little Deschutes Restoration project area.

Purpose and Need for Action

The purpose of this project is restoration related: 1) Maintaining or restoring the existing values and ecosystem services that a riparian environment provides through improving the hydrological function of the Little Deschutes River to benefit the unique habitats found within or adjacent to the river. 2)

[2] Provisioning services include: water quality, timber, and non-timber forest products such as matsutake mushrooms. Regulating services include: improvements to water quality, air quality, and soil quality. Supporting services include: biodiversity, notably high quality animal and plant habitat; and Cultural Services include: high quality dispersed and solitary recreation opportunities, traditional or spiritual connections with the land, and scenic views.

Maintaining or enhancing recreational experiences, with a sustainable road system that provides access while increasing wildlife security and reducing sedimentation to the river.

There is a need for an integrated approach to management and Ecosystem Services are most simply defined by the 2005 Millennium Ecosystem Assessment as "the benefits people obtain from ecosystems." The purpose provides for the need for action that are inter-related to the purposes of the project.

1. *There is a need to restore the unique habitats along or within the Little Deschutes River. This includes meadows, fens, fish spawning habitat, and Oregon spotted frog habitat by reconnecting the relic oxbows*[3] *back into the current hydrologic system.*
2. *There is a need to enhance sustainable recreation through removal of resource damaging dumpsites, redefine dispersed sites that are degrading water quality, restore riparian areas adjacent to campsites that have overuse and decommission dispersed sites that lead to resource damage.*
3. *There is a need to provide a sustainable transportation system to accommodate public access throughout the project area while increasing wildlife habitat effectiveness and reducing the resource damage. This damage includes disturbance to native vegetation, reduced soil productivity, and sedimentation into the Little Deschutes River.*

The Little Deschutes River, in both sections, has areas where bank instability is occurring creating areas where there is sparse or no vegetation and eroding cut banks which slough into the river contributing sedimentation to the river. There are multiple unauthorized routes throughout and along the river which are redundant and are also contributing sediment to the river, damaging vegetation, and removing vegetation along the banks of the river. There are unauthorized structures [channel diversion and bridge over the river (Figure 4 and Figure 5)] that would be removed and the channel restructured back into the river.

One of the goals of the Upper Little Deschutes Restoration project is to reduce the amount of roads but still provide access to the frequently used areas for recreation. Forest Service roads could be opened, or closed, to provide a more sustainable transportation system. This includes creating a ML 2 road for high clearance vehicles and ATVs to connect the 6100100 road to access the 6125 road (Gulick) through National Forest lands. This would be accomplished utilizing existing old roadbeds/decommissioned roads. On the southern end of the 6125 road there would be five turnouts created for winter snow plowing snow storage.

The intent of the riparian restoration work is to elevate the water table to improve shallow ground water storage and improve hyporheic exchange[4]. The majority of the restoration work will be focused on repairing riparian damage, reconnecting selected oxbows[5], adding large wood structures (single logs, multiple logs, or beaver dam analog structures) to reconnect the river with side channels (relic oxbows), creating additional habitat for Oregon spotted frogs, improving aquatic habitat for fish, removing some of the encroaching lodgepole to help move the meadow back to an early seral

[3] **Oxbow:** a U-shaped body of water that is an old stream channel that was originally a bend in the river but became separated when the river took a new, straighter course. Also known as an oxbow lake or meander cutoff.

[4] **Hyporheic exchange** is the mixing of surface and shallow subsurface water through porous sediment surrounding a river and is driven by spatial and temporal variations in channel characteristics (streambed pressure, bed mobility, alluvial volume and hydraulic conductivity). Hyporheic exchange in mountain rivers I - USDA Forest Service *https://www.fs.fed.us/rm/pubs_other/rmrs_2009_tonina_d001.pdf*

[5] **Reconnecting Oxbows-**The majority of the oxbows will use the elevated water table to reconnect so they may be connected in the spring with high water and disconnected as water levels drop. Depending on the ground location, equipment maybe utilized to reconnect some of the oxbows.

stage, and redefining the transportation system to a sustainable level on the landscape. This would include, but not limited to, ripping excess and/or unclassified roads, redirecting the diversion to the pond and back into the river, filling in the remaining diversion ditch from the pond access to the private land, removing unauthorized structures, bouldering to prevent driving access to meadows, planting native riparian vegetation along restored areas, transplanting willows etc.

Figure 5. Denuded Spots/Erosion along the River Bank and an Unauthorized Bridge over the Little Deschutes River

Proposed Action

The following Proposed Actions are being designed to meet the purpose and needs of the project.

Riparian enhancement and restoration would include the enhancement of habitat for Oregon spotted frogs and various trout species through the installation of instream structures consisting of single to multiple logs and/or beaver dam analog structures that would be constructed of smaller logs that would span the river and reconnection of diverted water to the river. Also included would be enhancement of riparian and aspen habitats through the removal of encroaching lodgepole pine, removing unauthorized bridge type structures, and redefining or decommissioning dispersed recreation sites.

Actions would include the following:

1. Instream work by excavator: placement of tree structures, beaver dam analogs, and/or reshaping connections to selected side channels. Project work would be at select sites along nearly 10 miles of stream channel[6] (see Figure 6 and Figure 7).
    a. Trees would be tipped over with an excavator and moved intact (some will include rootwads) to the placement site. Lodgepole pine trees encroaching on the meadow within approximately 300 feet[7] of the river would also be a source for instream multi-log structures and/or beaver dam analogs.
        i. Where there is no access for equipment, hand falling of lodgepole for beaver analog structures would occur.
        ii. Additional hand equipment such as post pounder may also be utilized.
    b. Reshaping and/or closing an unauthorized water diversion ditch. The upstream portion of the ditch would be contoured to increase water residence time and hold

[6] Instream structure (single log, multiple logs, or beaver dam analog structures) locations are approximate on the map. Actual placement may be shifted or not installed for best fit on-the-ground to meet project intent.
[7] There may be trees cut outside the 300 feet based on the contour of the meadow near the river.

water through a pond to a point where it would be connected to the log pond and then back to the river. The remaining portion past where it was diverted to the log pond would be filled in and rehabilitated with native vegetation.

2. Removal of two unauthorized bridges over the Little Deschutes River would include bank recontouring, reclaiming the gravel, and rehabilitation of the stream banks.
    a. Rehabilitation of this area would consist of transplant/planting of native sedges, rushes, and willows etc.
3. Removing encroaching lodgepole pine along the edges of the stringer meadows and within aspen stands adjacent to the river to maintain the meadow habitat of approximately 244 acres.
    a. Fuels treatments would include: lop and scatter and/or piling where concentrations are heavy. Piles may be burned, or left for wildlife.
    b. Aspen may be caged or fenced to protect them.
    c. Future maintenance work may include re-entry into the meadows to lop and scatter the seedlings/sapling to maintain the meadow.
    d. Maintenance/repair and/or expansion of the instream structures may be required as the site evolves.
4. Redefining/rehabilitating dispersed campsites to reduce the impacts to the river and riparian areas from creep[8], erosion, and sedimentation (See sustainable recreation for action details).

[8] Creep- to slip or gradually shift position (Merriam-Webster Dictionary 2018)

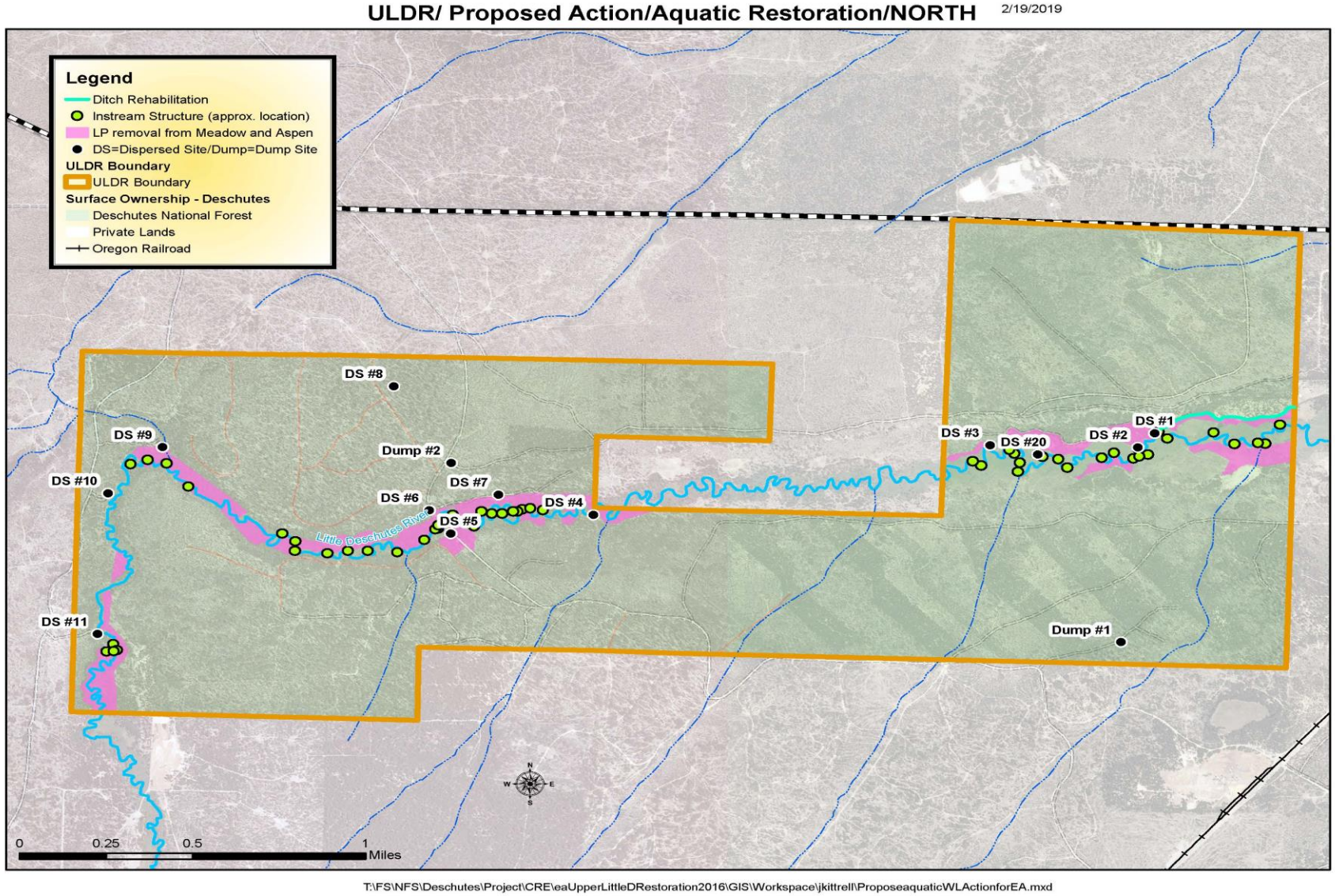

Figure 6. Ditch Rehabilitation Area and the Proposed Placement of Log Structures to Reconnect Relic Oxbows back to the Mainstem (North)

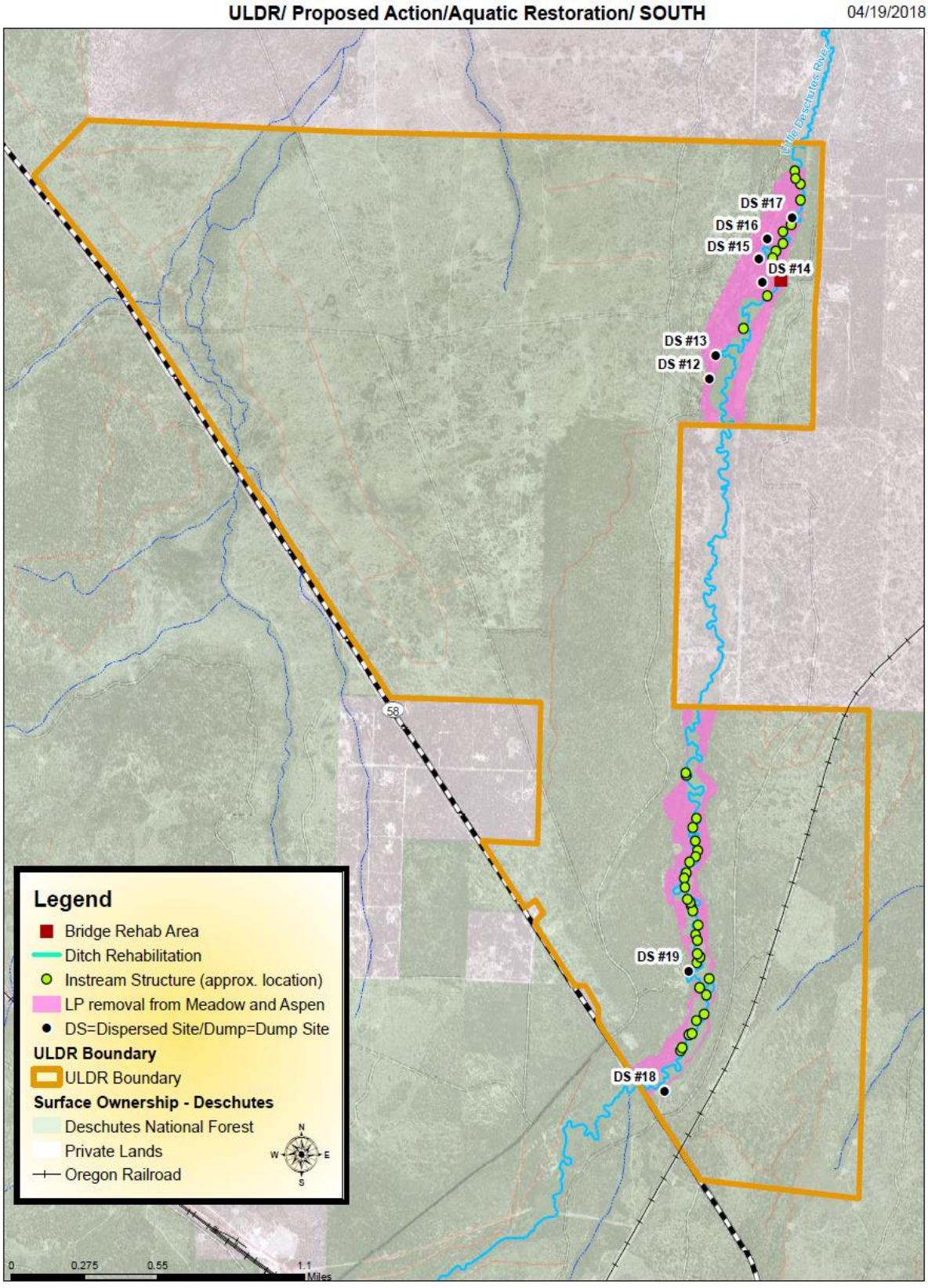

Figure 7. Map of Proposed Restoration Instream Structures along the Little Deschutes River

Sustainable recreation proposed actions would provide recreational opportunities while reducing impacts to riparian and sensitive upland wildlife habitat. There are 20 dispersed sites (DS) and two dump sites (DUMP) that have been identified in the planning area (Table 1 and Figure 10 and Figure 12). Of the 20 dispersed sites, many have slowly expanded through the years into the riparian area and structures such as benches, game poles[9], fire rings, and tire swings etc. have been added. This expansion, when left unchecked, contributes to sedimentation, reduced plant and wildlife habitat, erosion, impairs water quality, water storage, and recreation impacts.

Actions would include:

1. Increase Forest Service patrols into this area including education and enforcement of Travel Management rules. This may be a combination of Law Enforcement (LEO), Field Rangers, Forest Protection Officers (FPO) or District personnel.
2. Forest System roads would be designated to access appropriate dispersed sites.
    a. Place informational signs within the road prism at boundary of Forest and private lands along the 6125 (Gulick), 6100-100, and 5800-100 roads, as funding allows.
3. Rehabilitation of dispersed sites (see Table 1) would be accomplished to the degree needed by each site and may include different intensities of the following:
    a. Mechanized equipment may be used to loosen and recontour the soil surface in order to reduce compaction and erosion, improve infiltration, and create planting sites.
    b. Native vegetation (willow stakes, aspen etc.) would be planted and native grasses utilized to re-seed areas.
4. Dispersed sites redefined and/or rehabilitated or decommissioned.
    a. Boulders, logs, fences, bollards, or other materials would be utilized to redefine the sites and various unauthorized structures would be removed.
    b. Redefined sites would be pulled back from riparian areas and/or reduced in size due to resource or recreation impacts.
    c. Decommissioned sites would have roads closed to site and would be revegetated to the extent necessary.
5. Two known dump sites would be cleaned up and rehabilitated. Any additional sites where trash is discovered would be cleaned up and rehabilitated as well (see Table 1).
6. Installation of a single panel interpretive sign near the Little Deschutes Cabin.[10]
    a. The sign would be installed near the FS 6125-880 road for maximum visibility and require the excavation of two post-holes.
    b. If fencing is required near the Little Deschutes Cabin to restrict vehicle access to meadow/river, buck and pole type fencing will be placed by hand. No ground disturbance is allowed.
7. Utilize existing roads and closed roads to identify a through route to the 6125 (Gulick Road; see sustainable transportation).

[9] A small diameter tree stripped of branches and fastened between two trees to hang the carcass of game animals.

[10] The Little Deschutes Cabin is a historic location utilized by organized groups for permitted events as well as by individuals and small groups for dispersed camping. Since the integrity of this structure is still relatively good, installation of interpretive panels would be not only to share the history of the area but also to encourage its continued stewardship. Interpretation of the site would also increase public education and awareness of the National Historic Preservation Act and the Archaeological Resource Protection Act.

Figure 8. Dispersed Campsite that has Expanded Over Time

Table 1. Little Deschutes Dispersed Camping and Unauthorized Dump Sites

Site #	Action
Northern Portion	
DS #1	Boulder/log placement to remove vehicle access to meadow and riparian from the site. Site will be redefined. Rehab* ruts into the meadow.
DS #2	DS#2 is accessible from DS#1. Boulder/log placement to remove vehicle access to meadow and riparian. Site will be redefined. Rehab ruts into the meadow.
DS #3	No changes needed, maintain through Field Ranger presence.
DS #4	No changes needed, maintain through Field Ranger presence.
DS #5	Pull boundary of site away from the river, define limits of site through bouldering, utilizing logs and/or revegetating.
DS #6	Pull boundary of site away from the riparian/ river, define limits of site through bouldering, bollards, utilizing logs and/or revegetating. Maintain through signage and Field Ranger presence.
DS #7	No changes needed.
DS #8	Site will be decommissioned. After cleanup of discarded trash site will be rehabbed with native vegetation
DS #9	Vehicle access from the site down into the meadow/river area will be blocked, and site boundaries redefined utilizing a combination of brush, bouldering, bollards, and/or signage. Maintain through Field Ranger presence.
DS #10	No changes needed.
DS #11	Riparian site, pull boundary of site away from the riparian area, define with brush, bouldering and/or signage. Maintain through Field Ranger presence.
DS #20	Riparian site, pull boundary away from riparian area. Define limits of site through bouldering, utilizing logs and/or revegetating. Close UA 013 to vehicular traffic-foot traffic will be permitted.
Dump #1	Clean, close, and rehab this unauthorized dump site. Decommission the 9770-450 and -451 roads.

Site #	Action
Dump #2	Clean this unauthorized dump site and will be patrolled by a Field Ranger or other District personnel.
Southern Portion	
DS #12	Site is expanding. Define site boundary through fencing, bouldering, bollards, utilizing logs and/or revegetating.
DS #13	Riparian site, pull boundary of site away from the riparian area, define with fencing, brush, bouldering, bollards, and/or signage and rehab riparian area.
DS #14	Close vehicle access to site. Rehab damage, walk-in only. Remove unauthorized bridge over the river. Define with fencing, brush, bouldering, bollards, or utilizing logs. Native vegetation may be planted. See Riparian Enhancement #2.
DS #15	Remove unauthorized footbridge and redefine with brush, bouldering, bollards, and/or signage and rehab riparian area.
DS #16	Pull boundary of site away from the riparian area, define with brush, bouldering, bollards, and/or signage and rehab riparian area.
DS #17	Pull boundary of site away from the riparian area, define with brush, bouldering, bollards, and/or signage and rehab riparian area.
DS #18	Old Campground area. Define site to existing boundary by utilizing brush, bouldering, bollards, and/or signage and rehab riparian area.
DS #19	Cabin and adjacent site. Utilize buck and pole fencing to be placed by hand to restrict vehicle access to river/meadow. No machinery use in site.

*Rehabilitation could include redefining the site (that could include bouldering, utilizing logs for the perimeter etc.), removing unauthorized structures, replanting native vegetation (willow stakes, aspen etc.) and native grasses utilized to re-seed areas.

Sustainable transportation proposed actions would create a road system that maintains public access throughout the project area while protecting wildlife and reducing resource damage such as vegetation loss and river sedimentation due to unmanaged vehicle use. The Interdisciplinary Team (IDT) evaluated all roads in the two sections of the project area to determine how existing roads are currently being utilized. In addition, the team determined which roads were unauthorized (non-system roads) and analyzed the need to change road maintenance levels (open vs closed). Also evaluated was road access to private lands and fire and emergency access. Additionally, road densities in the project area were evaluated for consistency with the Deschutes National Forest Land and Resource Management Plan (1990). After an internal review was completed, Forest Service transportation engineers met with the Walker Range Fire Patrol Association to ensure that critical access and evacuation routes remained available.

Figure 9 and Figure 11 display the existing road system and currently known unclassified or unauthorized roads with Figure 10 and Figure 12 displaying changes proposed. All other roads not displayed would be decommissioned or closed as described in Table 2. Unauthorized trails and routes have been created over time and continue to be created. These routes are not part of the planned transportation system through the area. As unauthorized routes, or previously closed roads which have been breached, are discovered they would be reviewed by the specialists and then decommissioned and/or rehabilitated to the degree needed to return the ground to a productive state.

For roads/routes the following would apply:

1. Road construction, maintenance, and reconstruction
    a. Utilize existing roads and closed roads to identify a through route or potential re-routes to reconstruct a through route to the 6125 road and loop routes for ML 2 roads.

These roads are for use by high-clearance vehicles (including all-terrain vehicles to minimize ground disturbance.

b. Reinforce ML 1 closures in sensitive areas by utilizing earthen barriers, bouldering, logs, and native vegetation.
c. Place roads not currently needed for management activities into storage at ML 1 to decrease disturbance to wildlife.
d. Decommission unauthorized roads and trails to increase core wildlife habitat, reduce sediment into streams, and reduce motorized access to sensitive meadows and wetlands.
e. Add five turnouts on the southern section of Forest Service Road 6125 for safety and for snow removal. Turnouts would be approximately 50' x 25' (see Figure 12 for approximate locations).

2. Provide for access to private lands
    a. Utilize special use permits and/or road use permits for adjacent landowners requiring access across National Forest lands for primary access to private parcels or emergency ingress/egress.

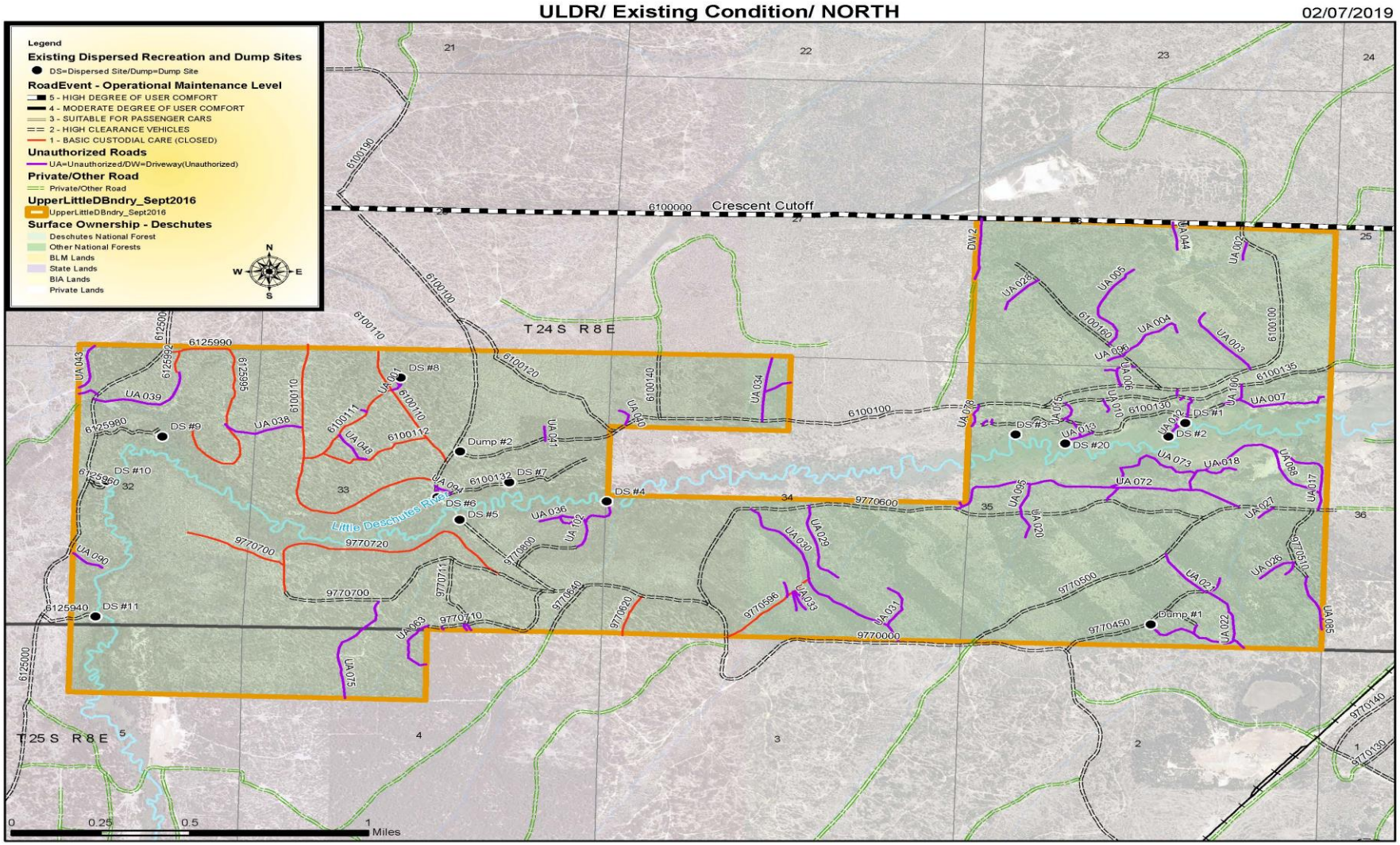

Figure 9. Upper Little Deschutes Existing Road Conditions (North)

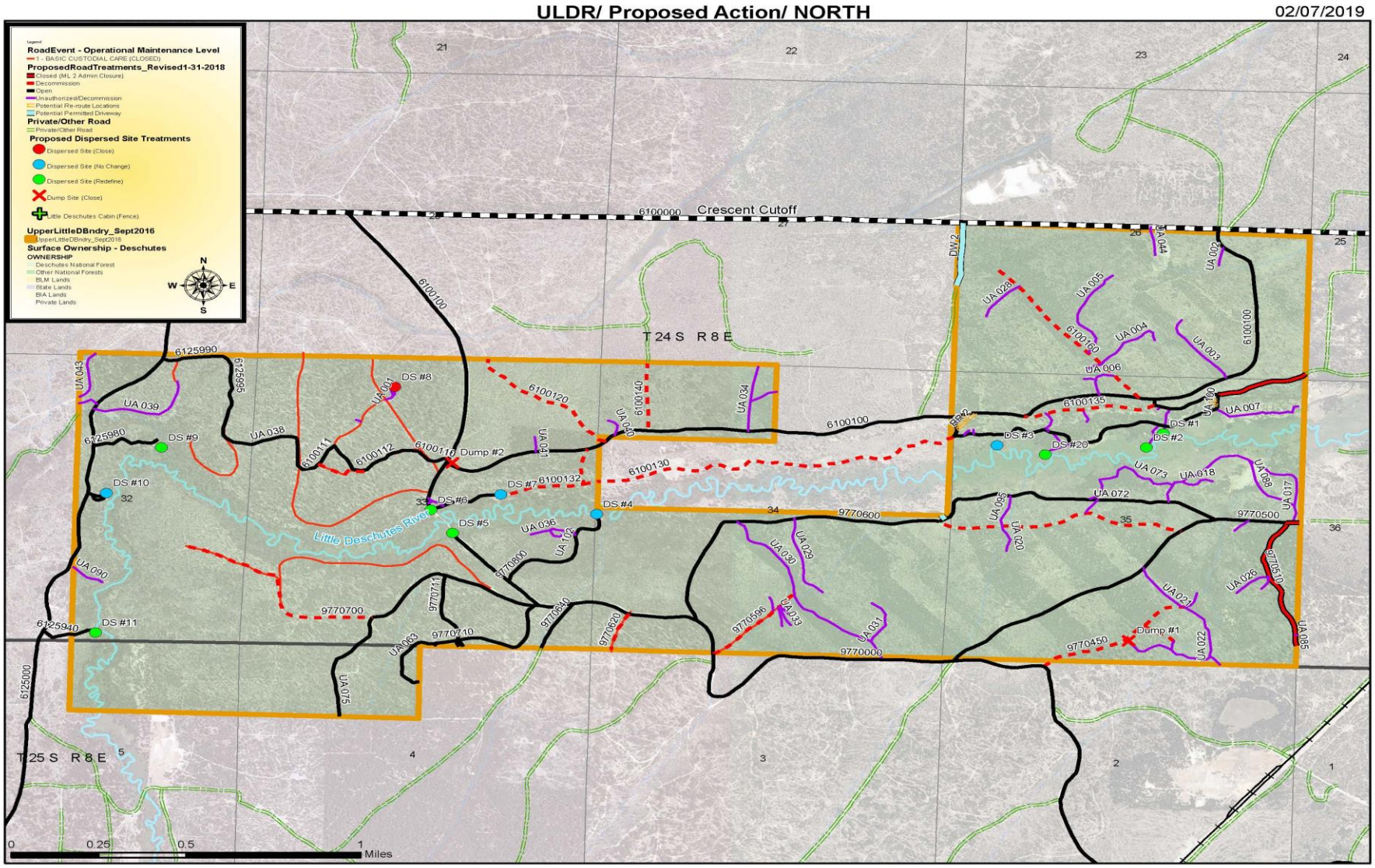

Figure 10. Upper Little Deschutes Proposed Road Changes (North)

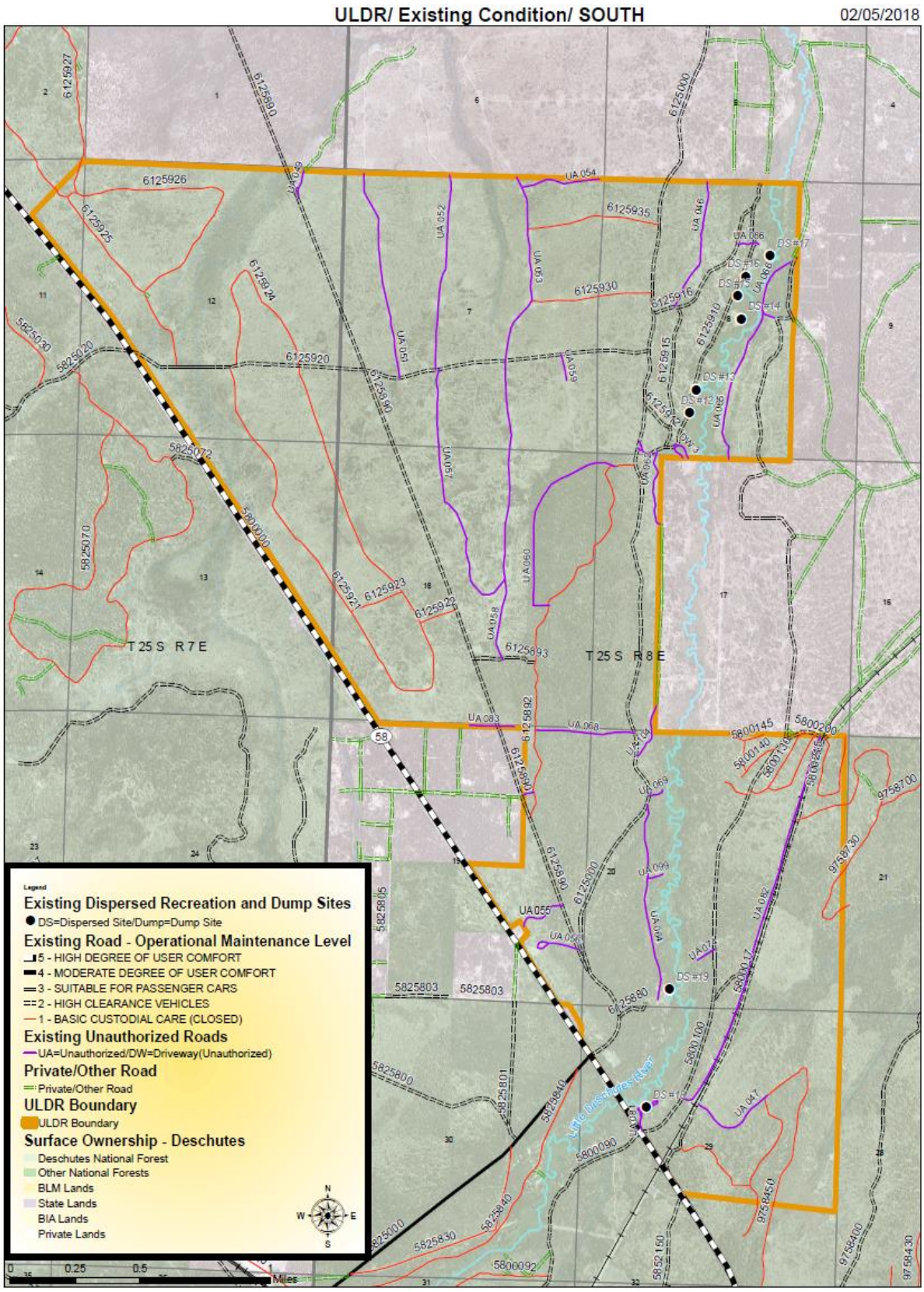

Figure 11. Upper Little Deschutes Existing Road Conditions (South)

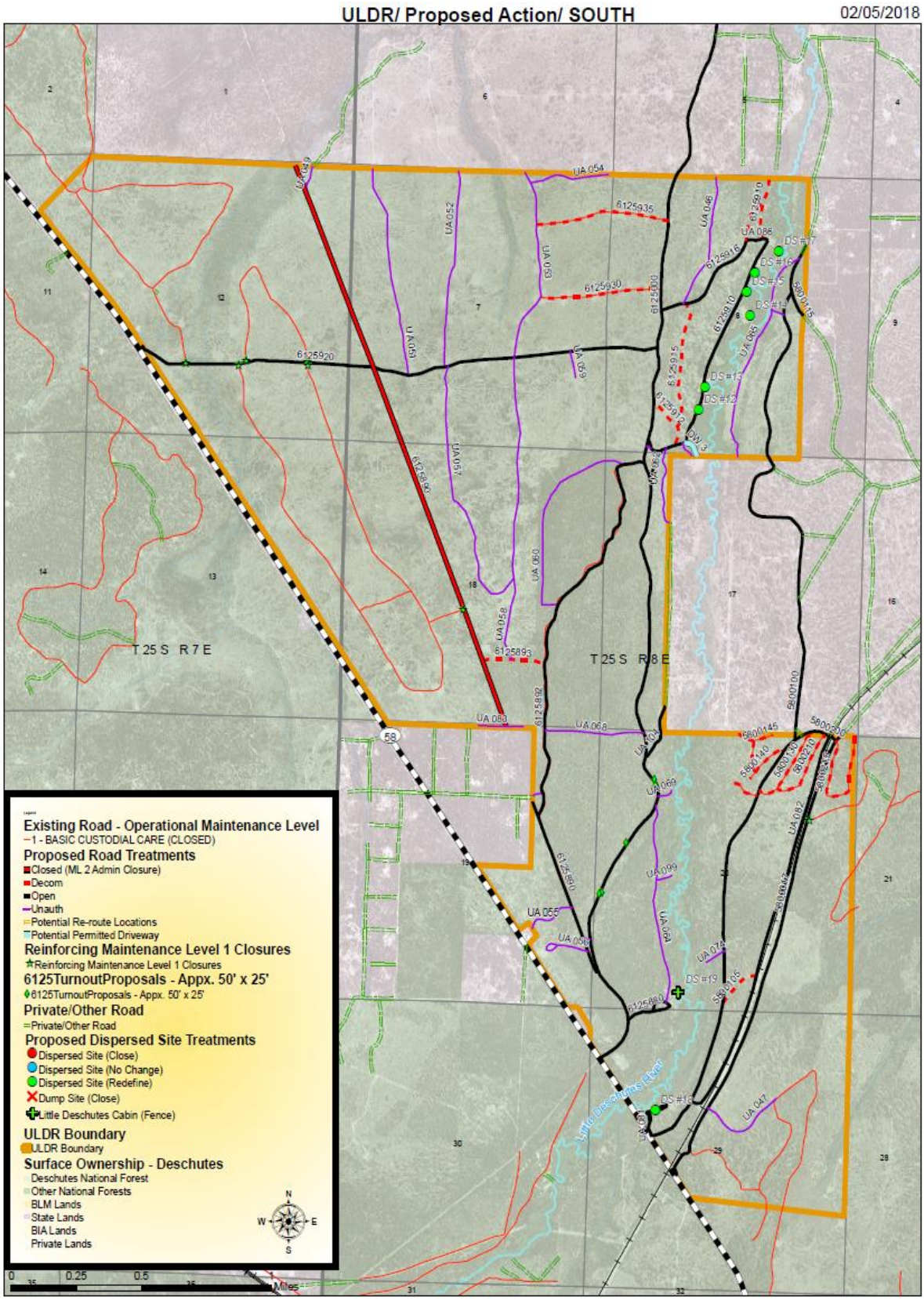

Figure 12. Upper Little Deschutes Proposed Road Changes (South)

Table 2 shows the proposed changes to the National Forest Service Road System in the Proposed Action. Proposed miles treated shows the road segment length that the proposed treatment would affect. If the current mileage shows 1.00 and the proposed treatment miles are 0.50 then only half of the road would be receiving a proposed change in status and the other half is to remain as it currently exists. If the status change is decommission or administrative use only then would the road receive a physical treatment. If the change is to a ML 2 road, then this change would be reflected on MVUM maps and in the Forest Service databases.

Table 2. ULDR Proposed Road Changes

Road Number	Current Road Status	Current Miles	Proposed Change In Road Status	Proposed Miles Treated	Reason For Proposed Change
Northern Section					
6100100	ML 2	4.00	No change	0.00	This is a 4.00 mile loop off of the Crescent Cutoff Road (County Road 61). This road is partially under an easement (approx. 0.54 miles through private land) and has a request in place by the private land owner to re-route the portion through his parcel. This would all be located on private land and an easement would be retained on the re-routed portion of the 6100100 Road.
6100120	ML 2	0.50	Decommission	0.50	It is a short cut connecting the SW portion to the NW portion of the 6100100 Road.
6100130					**(Create a loop through Forest Service land and eliminate through access on private land on the 6100130 Road)**
(Proposed Road # 6100130)	Unauthorized – UA 078	0.08	ML 2	0.08	a. Open the western loop to the east of the private boundary (Road is proposed to be 6100130). Potential re-route locations, RR 2 and 3 as labeled on map, exist due to steep grade of existing road location.
6100130	ML 2	0.70	ML 2 No change	0.70	b. Utilize the (0.70 miles) of existing 6100130 Road along the Little Deschutes River.
(Proposed Road # 6100130) 6100135 (Proposed Road # 6100130)	Unauthorized – UA 101 Unauthorized – UA 100 ML 2	0.05 0.05 0.80	ML 2 ML 2 ML 2 No change – only number change	0.05 0.05 0.20	c. This will provide the eastern loop up to the 6100135 Road. Potential re-route location, RR 1 as labeled on map, exist due to steep grade of existing location. d. Utilize (0.20 miles) of the existing 6100135 Road to connect it to the unauthorized – UA 077 road that will connect the loop back to the 6100100 Road.
(Proposed Road # 6100130)	Unauthorized – UA 077	0.02	ML 2	0.02	e. This is the unauthorized road that would connect the eastern loop back to the 6100100 Road.
6100135	ML 2	0.80	Decommission	0.34	f. Decommission a portion (0.34 miles) of the 6100135 Road where it parallels the 6100100 Road.

Road Number	Current Road Status	Current Miles	Proposed Change In Road Status	Proposed Miles Treated	Reason For Proposed Change
6100135	ML 2	0.80	ML 2 - Administrative use only	0.26	g. Close for Administrative use only (ML 2) the portion of the existing 6100135 (0.26 miles) where it goes east to the private boundary as secondary residential fire egress.
6100130	Currently not part of the system – possibly an unauthorized road or part of the 6100130 that went through private.	0.23	Decommission	0.23	This was a segment of road just west of the private boundary where the 6100130 Road used to go through the private and tie in with the 6100132 Road.
6100132 Near bridge-out (north)	ML 2	0.63	Decommission	0.37	Decommission the last 0.37 miles from DS #7 to the 6100100.
6100140	ML 2	0.23	Decommission	0.23	Accesses private land. Forest Service has no known easements.
6100160	ML 2	0.61	Decommission	0.61	Dead end – No through access.
(Proposed Road # 6125990)					**The proposed 1.52 miles would connect the 6100100 Road to the 6125 (Gulick Road) through National Forest Service land using existing roads (some are part of the National Forest Road System and others are Unauthorized). * Roads are listed moving from east (6100100 Road) to west (6125 Road) along proposed route and not in numerical order.**
6100110	ML 1	0.45	ML 2	0.10	Eastern portion – road loops through private but is two segments in Forest Service data.
6100112	ML 1	0.38	ML 2	0.19	
6100112	ML 1	0.38	Decommission	0.19	
UA 048	Unauthorized	0.12	ML 2	0.12	
6100111	ML 1	0.34	ML 2	0.14	
6100110	ML 1	1.01	ML 2	0.11	Western portion – road loops through private but is two segments in Forest Service data.
UA 038	Unauthorized	0.23	ML 2	0.23	
6125995	ML 1	0.62	ML 2	0.29	
6125990	ML 1	0.15	ML 2	0.15	
9770450	ML 2	0.53	Decommission	0.53	Area may be accessed by surrounding roads. Eliminate access to unauthorized dumping location.
9770451	ML 2	0.04	Decommission	0.04	Area may be accessed by surrounding roads.
9770500	ML 2	1.00	ML 2 - Administrative use only	0.04	0.04 miles would change to administrative use only ML 2 road (access to private) as secondary residential fire egress.
9770510	ML 2	0.29	ML 2 - Administrative use only	0.29	9770510 would change to administrative use only ML 2 road (access to private) as secondary residential fire egress.
UA 085	Unauthorized	0.20	ML 2 - Administrative use only	0.20	Unauthorized – UA 085 would change to an administrative use only ML 2 road (access to private) as secondary residential fire egress.
9770596	ML 1	0.20	Decommission	0.20	Area may be accessed by surrounding roads.

Road Number	Current Road Status	Current Miles	Proposed Change In Road Status	Proposed Miles Treated	Reason For Proposed Change
(Proposed Road # 9770600) 9770600	Unauthorized – UA 072 ML 2	0.87 2.00	ML 2 Decommission	0.87 0.72	a. This road just south of the Little Deschutes River is in a Special Management Area and would become the 9770600 Road, while the portion of the original 9770600 Road to the south would be decommissioned. b. Southern portion of the original 9770600 Road.
9770620	ML 1	0.15	Decommission	0.15	Decommission due to main use being for access to private and is overgrown.
9770700	ML 2	0.62	Decommission	0.15	Decommission 0.15 miles of the ML 2 portion of the 9770700 Road; This section of road has already been physically closed/decommissioned but there may be additional treatment required.
9770700	ML 1	0.28	Decommission	0.28	This is the ML 1 portion that dead ends and doesn't provide necessary access.
(Proposed Road # 9770701)	Unauthorized – UA 075	0.40	ML 2	0.40	Add unauthorized road to National Forest Road System due to primary access for private land owners.
(Proposed Road # 9770706)	Unauthorized – DW 6	0.03	ML 2	0.03	Add unauthorized road to National Forest Road System due to primary access for private land owners.
(Proposed Road # 9770707)	Unauthorized – DW 5	0.02	ML 2	0.02	Add unauthorized road to National Forest Road System due to primary access for private land owners.
(Proposed Road # 9770708)	Unauthorized – DW 4	0.01	ML 2	0.01	Add unauthorized road to National Forest Road System due to primary access for private land owners.
(Proposed Road # 9770709)	Unauthorized – UA 063	0.20	ML 2	0.20	Add unauthorized road to National Forest Road System due to primary access for private land owners. (This is the segment of road to the west of the 9770710 Road that hooks around to the south).
UA 102	Unauthorized	0.22	ML 2	0.22	This is off the end of the 9770800 Road and is the access to DS #4 therefore will be added to the National Forest Road System.
DW 1	Unauthorized	0.02	Under Permit	0.02	This will potentially be a road under Special Use Permit for access to private land. This will not be part of the National Forest Road System.
DW 2	Unauthorized	0.22	Under Permit	0.22	This will potentially be a road under Special Use Permit for access to private land. This will not be part of the National Forest Road System.
Southern Section					
(Proposed Road # 5800101)	Unauthorized – UA 081	0.28	ML 2	0.28	This accesses DS #18 (formerly the Little Deschutes Campground) and should be added to the National Forest Road System.
5800105	ML 2	0.10	Decommission	0.10	This is another connector road from the 5800100 Road to the unauthorized road UA 082 that already exists to the north.
5800120	ML 1	0.13	Decommission	0.13	This road is already revegetated.
5800130	ML 1	0.31	Decommission	0.31	This road doesn't provide necessary access due to proximity to the 5800100 Road.
5800140	ML 1	0.17	Decommission	0.17	This road is already revegetated.
5800145	ML 1	0.17	Decommission	0.17	This road is only accessible through private land.

Road Number	Current Road Status	Current Miles	Proposed Change In Road Status	Proposed Miles Treated	Reason For Proposed Change
5800146	ML 1	0.07	Decommission	0.07	This road is only accessible through private land.
5800200	ML 1	0.01	Decommission	0.01	This is the beginning of the 5800215 that is proposed to be decommissioned.
5800210	ML 1	0.28	Decommission	0.28	This road is already revegetated.
5800215	ML 1	0.49	Decommission	0.49	This road has begun to revegetate and would require minimal treatment. It accesses private land.
6125 – southern portion	ML 2	3.45	No Change	3.45	Add 5 turnout locations (labeled as T1-5 on maps) between Milepost 4.79 and 6.09 to allow for increased safety for passing vehicles, especially in the winter when this portion of the road narrows due to plowing (Approximate 50' x 25'). The southern portion of the 6125 Road that is under Forest Service jurisdiction is from Milepost 2.64 (private boundary) to Milepost 6.09 (junction with Hwy. 58).
6125890	ML 2	2.85	ML 2 - Administrative use only	2.21	The proposed change would be on the northern portion of the 6125890 Road from private boundary to private boundary. It would change from a ML 2 to a ML 2 - administrative use only. This will allow for intermittent administrative use while decreasing the current use and increasing wildlife habitat effectiveness. The first 0.64 miles off the 6125 Road will remain open as ML 2 (no change from current).
6125892	ML 1	1.20	ML 2	1.20	Provides an open loop from the 6125890 Road to the 6125 Road.
6125893	ML 2	0.20	Decommission	0.20	Crosses riparian and accesses a road that is proposed to be a (closed) administrative use only ML 2 road.
(Proposed Road # 6125900)	Unauthorized – UA 104	0.21	ML 2	0.21	Main access for residents on private land. Labeled on map as UA 104 but is marked on the ground as the 6125900 Road.
6125910	ML 2	1.20	Decommission	0.22	Decommission 0.22 miles at the end of the road from the junction with UA 086 Road to the private boundary. Rehabilitate unauthorized pull-outs and parking areas for dispersed sites along the road that are causing resource concerns.
(Proposed Road # 6125910)	Unauthorized – UA 103	0.08	ML 2	0.08	This is the northern y-intersection for the 6125910 Road to connect to the 6125 Road.
6125912	ML 2	0.20	Decommission	0.20	Area may be accessed by surrounding roads.
6125915	ML 2	0.40	Decommission	0.40	Area may be accessed by surrounding roads.
6125916	ML 2	0.58	Decommission	0.15	Decommission 0.15 miles from the junction with the UA 086 Road to the junction with the 6125910 Road.
(Proposed Road # 6125916)	Unauthorized – UA 086	0.08	ML 2	0.08	This would create the open loop connecting the 6125910 Road to the 6125916 Road.
6125930	ML 1	0.48	Decommission	0.48	Accesses unauthorized road that will be decommissioned.
6125935	ML 1	0.32	Decommission	0.32	Accesses unauthorized road that will be decommissioned.

Road Number	Current Road Status	Current Miles	Proposed Change In Road Status	Proposed Miles Treated	Reason For Proposed Change
DW 3	Unauthorized	0.08	Under Permit	0.08	This will potentially be a road under Special Use Permit for access to private land. This will not be part of the National Forest Road System.

Table 3. Total Mileages for Proposed Road Treatments within the ULDR Analysis Area

	Total Miles	Notes
Total National Forest System Road Miles Opened (ML 2):	2.48	
Total Unauthorized Roads Opened (ML 2):	4.42	UA 082 (1.46 miles long) is included in this mileage for calculating road densities (open road mileage within the ULDR boundary) but will not become a National Forest System Road. It is a railroad access road so it will remain as it currently exists on the ground (**2.96 miles**) of unauthorized roads are proposed to become part of the National Forest Road System.
Total National Forest System Road Miles Closed (ML 2 – Administrative Use Only):	2.76	
Total Unauthorized Road Miles Closed (ML 2 – Administrative Use Only):	0.20	This is identified on road maps as UA 085 and is to provide secondary residential fire egress.
Total National Forest Road Miles Decommissioned:	9.37	
Total Unauthorized Road Miles Decommissioned:	17.18	Decommission all unauthorized roads (unless specifically listed with a proposed change in the table above) due to resource damage and/or concerns.

Maintenance Levels

Maintenance Level 1: These are roads that have been placed in storage between intermittent uses. The period of storage must exceed one year. Basic custodial maintenance is performed to prevent damage to adjacent resources and to perpetuate the road for future resource management needs. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level. These roads are not shown on motor vehicle use maps.

Maintenance Level 2: Assigned to roads open for use by high-clearance vehicles (including All Terrain Vehicles [ATVs]). Passenger car traffic, user comfort, and user convenience are not considerations. Warning signs and traffic control devices are not provided with the exception that some signing, such as W-18-1 "No Traffic Signs" may be posted at intersections. Motorists should have no expectations of being alerted to potential hazards while driving these roads. Traffic normally is minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log haul may occur at this level.

***Administrative Use Only (ML 2 through ML 5)*:** Road is open to limited motorized use by permit/authorization only and is not open to the general public and will therefore not be identified on the MVUM (Motor Vehicle Use Map). It may be maintained at any maintenance level that is determined necessary.

Unauthorized Road or Trail: A road that is not a forest road or a temporary road and that is not included in a forest transportation atlas. Any unauthorized roads listed in this table will have the identifier UA - *** that is associated with the labeling used on the road maps.

Decommission: The goal of decommissioning unneeded roads within the Upper Little Deschutes Restoration analysis area is removal from the National Forest Road System through reestablishing vegetation and, if necessary, initiating restoration of ecological processes interrupted or adversely impacted by the unneeded road (Forest Service Manual 7700 – Travel Management, Chapter 7730, 7734.1 – Decommissioning Treatments, 2014).

Closure: Maintenance Level 1 (closed) roads are roads that have been determined necessary intermittent transportation facilities and are held in a stored status between intermittent uses. Treatments for closing a road to vehicular traffic may mimic decommissioning treatments. The most common treatment being blocking the entrance(s) and/or scattering slash on the roadbed. For closure methods to be successful each road may be evaluated for the surrounding terrain and vegetation type and methods chosen accordingly. See Project Design Features for decommission/closure methods.

Proposed road mileages listed in Table 2 and Table 3 reflect what the length of road will be after proposed treatment. If the current mileage shows 1.00 and the proposed treatment miles are 0.50 then only half of the road will be receiving a proposed change in status and the other half is to remain as it exists currently.

Public Involvement

On March 4, 2016, a letter was sent to organizations and individual citizens on the Crescent Ranger District mailing list inviting them to attend a values mapping exercise and to let the Forest Service know what they valued/found important in the proposed project area. On March 30th 2016 a pre-NEPA public meeting was held at the Crescent Community Club where participants worked with staff to draw connections between their values, landscape conditions, and management activities that would improve ecological function while delivering public benefits. With feedback elicited from the general public on the values they derived from the project area, the Forest Service staff created the Purpose and Need and Proposed Action. A scoping letter was sent out February 01, 2017 through March 10, 2017 and five comments were received. Two respondents thought it was well thought out and are looking forward to the public meeting. One respondent wanted to see the 9770710 remain open not only as their emergency escape route but as winter access due to steep slopes on the 9770711 road. One respondent is considering fencing off his private property through which the 6100100 runs due to the amount of garbage being left behind by visitors. One respondent supported reconnecting oxbows however it may not be necessary or desirable to reconnect all back into the system. Partial reconnection maybe a desirable compromise. This respondent also: a). Supports removal of small encroaching lodgepole but retain all large-old legacy trees greater than 21 inches dbh. b). Take care when utilizing heavy equipment in floodplains to avoid unacceptable impacts to wet soils, unique vegetation communities and habitat for risk species like amphibians and fish. c). Supports rationalizing the dispersed camping and road system in the area. d). Are concerned about legitimizing six miles of unauthorized roads. e). Supports the decision not to expand motorized trails in this area and the removal of an unauthorized bridge and diversion structure.

The comments were carefully reviewed by the IDT and District Ranger and some of these comments led to edits, clarifications, alternatives considered but eliminated, and additions to the preliminary EA.

An open house was held on May 23, 2017 to offer a chance for the Forest Service to meet and discuss with the interested public and receive their input or gain additional ideas on riparian enhancement, the

sustainable transportation system, sustainable recreation, and provide additional details on instream structure placement, to discuss log structures not impacting the private bridge that provides access their private parcels in Schoonover, removal of two unauthorized bridges, the unauthorized diversion ditch closure, and riparian meadow enhancement.

A public field trip took place on June 22, 2017 with several stops for discussion at areas of concern along the Little Deschutes River within the project area.

The project appeared continuously since Spring 2017 in the *Schedule of Proposed Actions for the Deschutes National Forest*, which also appears on the Deschutes National Forest's website: http://www.fs.fed.us/sopa/forest-level.php?110601.

The 30-day public comment period for the preliminary EA was initiated on June 8, 2018 (ended July 9, 2018) and resulted in written and oral comments from five individuals and one organization. This period started when the legal notice appeared in the newspaper of record, *The Bulletin*, Bend, Oregon. It was also posted simultaneously on the Deschutes National Forest/central Oregon website: https://data.ecosystem-management.org/nepaweb/nepa_project_exp.php?project=51024

Public comments ranged from considering leaving the unauthorized bridges so locals can cross the river in both summer and winter, identifying mis-mapped dispersed sites and unmapped dispersed sites, work to incorporate beavers to back flood the pond, try utilizing small jackstraw trees around the aspen vice fencing, incorporating log jams vice structures as water flow would float trees less than 21 inches dbh, and constructing a second access to allow an escape route for the Starlight Drive area.

The IDT addressed the comments with the responsible official. They considered but eliminated any unauthorized structures over the river, maps in the final EA were corrected to reflect the mis-mapped and unmapped dispersed sites, some log structures will retain rootwads to help stabilize the structures, log structure placement will be refined, and not all oxbows will be reconnected based on-the-ground intent to meet the riparian restoration. The idea of utilizing jack-strawed trees was considered but not utilized as snow would pack them down and allow ungulates to eat them before they could grow past the browse stage. The Transportation Planner and Special Uses Administrator met with individuals to address their road concerns and private access off of National System Roads.

Consultation with American Indian Tribes

During the early stages of this project, government-to-government contact was made with affected tribes including The Klamath Tribes, the Confederated Tribes of the Warm Springs, and the Burns Paiute Tribe. The proposed action was presented in consultation letters dated February 01, 2017 to the Tribal Chairs and their Cultural Resource Program Managers of all three tribes. The Klamath Tribes responded with interest to ensure that cultural surveys are conducted before any ground disturbing activities take place and that Project Design Features and Mitigation Measures are in place to protect culturally important areas.

A 30-day comment period for the preliminary Environmental Assessment (EA) was provided for The Klamath Tribes, the Confederated Tribes of the Warm Springs, and the Burns Paiute Tribe. This period started when the legal ad appeared in the paper of record, *The Bulletin*, Bend, Oregon on June 8, 2018. It was also posted simultaneously on the Deschutes National Forest/central Oregon website: https://data.ecosystem-management.org/nepaweb/nepa_project_exp.php?project=51024. No Tribal comments were received.

Consultation with Government Agencies

Informal coordination is occurring with federal, state, and local government officials. Formal consultation with the US Fish and Wildlife Service (USFWS) is ongoing.

Consultation has occurred with the Oregon State Historic Preservation Office. The National Historic Preservation Act obligations have been met. Following guidelines in a 2003 Regional Programmatic Agreement (PA) among USDA-Forest Service, the Advisory Council on Historic Preservation, and the Oregon State Historic Preservation Office (SHPO) a finding of *"No Adverse Effect"* was determined under Stipulation III(B)5 of the Programmatic Agreement. Project Design Features have been incorporated to protect any known sites or if any items of archeological or historical value are reported or discovered

Decision Framework

The responsible official for deciding the type and extent of management activities in the Upper Little Deschutes Restoration analysis area is the District Ranger of the Crescent Ranger District on the Deschutes National Forest. The responsible official can decide on several courses of action ranging from no action, to selecting one of many possible combinations in the project area. The responsible official will consider the following factors when making a decision:

1. How well the alternative(s) meets the project's purpose and need?
2. How well does the alternative respond to the ecosystem services value(s)?
3. Have public comments been considered during this analysis?
4. What are the likely environmental effects of the proposed action and alternative(s), and have mitigation measures/resource protection measures that would apply to project implementation been identified?
5. Has consultation with USFWS on the Oregon spotted frog been completed?

CHAPTER TWO - ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This chapter describes and compares the alternatives considered regarding the Upper Little Deschutes Restoration project. Alternative A, the "No Action" Alternative, is developed as a baseline to display consequences of a status quo scenario where no instream work is authorized, the roads remain, and the unauthorized ditch diverts water to private residences.

With the interconnectedness of values in the project area, designing a proposed action to enhance one value without reducing the benefits provided by another is difficult to accomplish. For example, thinning encroaching riparian lodgepole pine to improve hydrologic function and create more wildlife habitat will also likely mean a reduced sense of remoteness in the project area while these activities are occurring. While Project Design Features and Mitigation Measures can be used to minimize impacts on values, it must still be acknowledged that every action taken with this project will likely have tradeoffs and implications with respect to the diverse set of values that people have for the area.

Thus, the goal of the project is to balance these impacts, in such a way that the values most at risk get addressed without substantially reducing the ability of the landscape to provide any of the other benefits into the future. In its current condition, the landscape is in need of restoration and values at risk are diversity of riparian habitats, hydrological connectivity, and recreation (mostly in the form of dispersed camping, fishing, hunting etc.). The desired future condition is one in which risk has been reduced, the landscape has undergone restoration, and the current flow of ecosystem services has been maintained or enhanced. The alternatives considered in this project and presented in this EA represent different sets of actions that balance impacts to values differently, but that are aimed at the same desired outcome: enhanced ecosystem services flow across the landscape now and into the future.

Alternatives Considered in Detail

Alternative A – No Action

No Action

The No Action Alternative is included as a baseline comparison of continuing the existing conditions without implementing the proposed actions as required by the Council for Environmental Quality (CEQ) Regulations (40 CFR 1502.14).

Under the No Action Alternative, no specific management actions would be authorized as a result of this analysis. As a result, the ability of the landscape to provide the full suite of ecosystem services desired by the public would decline out into the future, as existing conditions are not addressed and improved, and threats are not mitigated.

Custodial activities would continue, such as routine maintenance of roads; however, no hydrologic or forest restoration would be implemented. Historic water diversions would remain in place, impeding free-flowing hydrology and altering natural hydrologic processes. No lodgepole pine encroaching into the riparian area would be removed. No activities would be conducted to enhance recreation or hunting experiences in the project area, nor would wildlife populations be enhanced through habitat creation. No prescribed fire for fire risk reduction would occur. As a result, the area would continue to become more at risk of large-scale wildfire and would become less defensible for firefighters in the event of a wildfire.

Alternative B

The Proposed Action

The Proposed Action is as described in Chapter One.

Resource Protection Measures

The following features are incorporated into the design of all activities included in the Upper Little Deschutes Restoration Project proposal. These are features that are considered routine, are either incorporated into contract provisions or accomplished between appropriate resource specialists, and have proven to be effective. Mitigation Measures are those that are site-specific, usually have a specific unit(s) assigned to them, are used to avoid, minimize, rectify, or compensate for an impact (40 CFR 1508.20). Project Design Features (PDF) and Mitigation Measures are used as a basis for determining and disclosing effects in the Environmental Consequences discussions.

Project Design Features

Cultural Resources

1. For any ground disturbance work, imported fill must be from a culturally sterile source (meaning there is no possible contamination from fill originating from another buried archaeological site).
2. If, prior to, or during construction work, items of archeological or historical value are reported or discovered, or an unknown deposit of such items is disturbed, work would immediately cease activities in the area affected. The Forest Service would be notified and ground disturbing activity would not resume until written authorization is provided.
3. Should human remains be encountered, the Native American Graves Protection and Repatriation Act (NAGPRA), 25 U.S.C. 3001 et seq. [Nov. 16, 1990] and its regulations (43 CFR §10) would apply.
4. During instream structure placement there will be no excavation, tree tip-ups, or heavy equipment within site buffers (30 meters/100 feet).
5. During lodgepole thinning, no heavy machinery, winching, or other ground disturbance within site buffers (30 meters/100 feet). Hand thinning allowed within site buffers. No piling or burning of slash within site buffers.
6. For road work, placement of boulders and slash allowed on a case-by-case basis and monitored as specified by the District Archaeologist. Otherwise, no ripping or ground disturbing work within site buffers (30 meters/100 feet).
7. During rehabilitation and/or closure of dispersed campsites, placement of boulders and slash allowed on a case-by-case basis and monitored as specified by the District Archaeologist. Otherwise, no ground disturbing work within site buffers (30 meters/100 feet).
8. Personnel will work with the District Archaeologist on fence and sign design and placement at the Little Deschutes cabin (DS#19).

Soils/Hydrology

9. Restoration of unauthorized roads and decommissioning of system roads should incorporate both soil decompaction and surface cover placement, where possible. Restoration actions may include, but are not limited to, utilizing an excavator or bulldozer-mounted subsoiling implement, using an excavator bucket to loosen compacted soils to a minimum depth of 16 inches, recontouring cuts and fills, mulching treated surfaces, pulling slash and woody materials over treated surfaces to establish effective ground cover protection where available, and or seeding/planting with native, locally-adapted species.

a. See Table 2 for road status.

10. Excavators, bulldozers, or other heavy equipment used for road closures, road decommissioning, and/or dispersed site restoration will remain on existing travelways or previously impacted surfaces at all times.
11. Excavators or other heavy equipment used for tree removal and/or instream wood placement will remain on upland soil areas and will be limited to two passes on any specific piece of ground. If more passes are required in a given location to achieve objectives, the excavator bucket will be used to scarify/decompact soils, place woody debris on the soil surface, and/or replace displaced soil.
12. All meadow restoration, recreation site rehab, and near-stream work where high water tables are present (saturated conditions within two feet of the soil surface, presence of riparian vegetation) will be either conducted by hand or conducted using tracked low ground pressure equipment when water tables are low enough and soil is dry enough to avoid damage. Machines may be permitted to reach in from upland areas, where feasible. Alternately, operating machinery over sufficient snow, frozen ground, or slash mats may be acceptable to limit detrimental soil disturbance.
13. All access routes and staging areas will be placed outside of sensitive/wet soil areas.
14. Equipment Refueling- Avoid or minimize adverse effects to soil, water quality and riparian resources from fuels, lubricants, cleaners and other harmful materials discharging into nearby surface waters or infiltrating through soils to contaminate groundwater resources during equipment refueling and servicing activities.
15. Allow temporary refueling and servicing only at approved locations, located well away from the aquatic maintenance zone (AMZ), groundwater recharge areas, and waterbodies. Refueling/maintenance may occur on existing road/disturbed surfaces away from live water.
16. Placement of instream structures will avoid a net rise in water level to avoid inundation and damage to private land, roads, and bridges.
17. All trees for instream work would be cut within approximately 300 feet of the river.
18. Equipment operators/operations will have a spill kit on site on site of sufficient size to clean up any spills and prevent further contamination.
19. Forest Service will be informed of any observed petroleum spills.

Fisheries/Aquatics

20. Avoid, minimize, or mitigate adverse impacts to water quality when working in aquatic ecosystems.
21. Meet instream/floodplain large woody material needs through the falling of lodgepole pine encroachment within riparian areas.
22. Place the instream structures so as to minimize shallow ground water storage on adjacent private property.
23. Locate access and staging areas near the project site but outside of work area boundaries, Aquatic Management Zones (AMZs), wetlands, and sensitive soil areas.
24. Avoid scheduling instream work during the spawning or migration seasons of resident or migratory fish and other important life history phases of sensitive species that could be affected by the project.
25. At beginning of the project install and appropriately maintain erosion control measures.
26. At beginning of the project install and appropriately maintain spill prevention and containment measures.

27. Allow temporary refueling and servicing only at approved locations, located well away from the AMZ, groundwater recharge areas, and waterbodies.
28. Close and rehabilitate designated motor vehicle use areas that are causing unacceptable adverse effects to soil, water quality, and riparian resources (see BMP Fac-10 [Facility Site Reclamation]).
29. Future maintenance work may include re-entry into the meadows to lop and scatter the seedlings/sapling to maintain the meadow.
30. Maintenance/repair and/or expansion of the instream structures may be required as the site evolves.

Invasive Plants

31. Actions conducted or authorized by the Forest Service that operate outside the limits of the road prism (including public works and service contracts) require the cleaning of equipment (i.e., bulldozers, skidders, graders, backhoes, dump trucks, etc.) prior to entering the National Forest System Lands. This requires that mud, dirt, and plant parts be removed from all heavy equipment and that cleaning must occur in areas where removed weed seeds will not create additional problems.
32. All gravel, fill, sand stockpiles, quarry sites and borrow materials used for this project would be inspected for invasive plants before such material is transported and used within National Forest System Lands. Any infested sources must be treated before use of pit material. Only gravel, fill, sand, and rock that are judged to be weed-free by District or Forest weed specialists would be used for this project.
33. Only weed-free straw and mulch will be used for projects conducted or authorized by the Forest Service on National Forest System Lands. If state certified straw and/or mulch is not available, the Forest should require a source be certified using the North American Weed Free Forage program standards or a similar certification process.
34. All native plant materials including seed, plugs, bare-root, and live stakes will be free of weed plant parts and propagules.
35. All Forest Service employees, volunteers, and contractors are required to inspect, remove, and properly dispose of weed seed and plant parts found on their clothing and personal equipment before entering National Forest Lands and prior to leaving a project site infested with weeds.
36. To prevent the introduction of aquatic invasive species, all Forest Service employees, volunteers, and contractors are required to have clean equipment and gear (watercraft, boots, waders, etc.) prior to entering any wetland or waterway. It is recommended that aquatic gear be rinsed and sterilized (with a chlorine bleach solution or a commercial disinfectant) as a preventive measure against the introduction of aquatic microorganisms.
37. All known weed sites would be treated prior to any ground disturbing activities.
38. Equipment and vehicles (contract and Forest Service) used in the project area will be cleaned of soil and plant parts before coming on the forest and before moving from areas infested with weeds to uninfected areas. Equipment will be inspected on-site by the Forest Service project manager or the District botanist prior to start of work.

Wildlife

39. No trees over 21 inches dbh would be cut, or pulled over, during the lodgepole removal to provide instream structures.
40. The majority of side channels or oxbows will use the elevated water table created by instream structures to reconnect during spring high flows and disconnect as water levels drop. Depending on ground conditions and location equipment may be utilized to reconnect some

of the oxbows. Existing or created deep pools would be constructed for reconnecting only during high flow to maintain separation of Oregon spotted frog (OSF) and fish.

41. A detailed Implementation and Monitoring Plan, including survey, capture/relocation details, will be developed and implemented by the Forest Service in coordination with the US Fish and Wildlife Service. Elements of the plan to include but not limited to:
    a. Surveying all reaches in spring for egg masses and summer/fall for adults.
    b. Survey just prior to implementation where ever and whenever work in potential habitat is done.
    c. Capture and relocation would most likely happen only where frogs are confined (ie ditch, unconnected oxbows) and not the stream.
    d. For instream structure placement activity chase frogs away from immediate area prior to structure installation would take place.
42. Seasonal Restriction to protect the Oregon spotted frog breeding sites: Activities within breeding habitat to occur after August 1st.

Table 4. Seasonal Restrictions

Species	Buffer Distance	Restricted Season	Actions Restricted
Northern Bald Eagle (nest)	¼ mile	January 1-August 31	If additional nest is found all activities within buffer, none currently within existing nest buffer (nest on private lands)
Goshawk (nest)	¼ mile	March 1- August 31	If nest is found all activities within buffer
Osprey (nest)	¼ mile	April 1 – August 31	If nest is found all activities within buffer
Red-tailed hawk (nest)	¼ mile	March 1 – August 31	If nest is found all activities within buffer
Sharp-shinned hawk (nest)	¼ mile	April 15 – August 31	If nest is found all activities within buffer
Cooper's hawk (nest)	¼ mile	April 1 – August 31	If additional nest is found all activities within buffer, none currently within existing nest buffer
Great gray owl (nest)	¼ mile	March 1 – June 30	If nest is found all activities within buffer
Northern Waterthrush	Occupied nesting habitat	May 15- August 1	Lodgepole pine removal, pile burning, stream enhancement.
Deer and Elk (fawning/calving habitat)	¼ mile	May 1 – June 30	All proposed actions within 0.25 mi of river

Recreation

43. No instream structures within 10 to 30 yards from known popular swimming holes unless site is enhanced by log placement.
44. To reduce impacts to the recreating public, interested publics would be notified of the schedule of implementation for activities planned on a yearly basis. Notification would generally take place in the spring and could be by email, US Postal Service letter, FS website and/or fliers.

Fuels

45. If there are any residual fuels, such as limbs and slash, left after project completion these fuels may be piled for burning in areas approved by the district archeologist, wildlife specialist, and soil specialist.
46. Where needed, fuels treatments may include: lop and scatter and/or piling where concentrations of slash are heavy. Piles may be burned or left for wildlife.
47. If lop and scatter is utilized, a bed of continuous fuel (unbroken fuel arrangement) with fine fuels (less than a quarter inch in diameter) and 10 hour fuels (0.25 to 1 inch in diameter) or combination of the two will not exceed three inches in depth.

Transportation

48. All of the proposed treatments will only occur on National Forest System Lands.
49. Roads listed as unauthorized may be decommissioned to the level that is necessary to protect resources. There may be additional unauthorized roads that are not identified on the map that may receive the same treatment after consulting with the District Archaeologist and other District Specialists.
50. Decommissioning includes applying various treatments, including one or more of the following:
    - Reestablishing former drainage patterns, stabilizing slopes, and restoring vegetation;
    - Blocking the entrance to a road or installing water bars;
    - Removing culverts, reestablishing drainages, removing unstable fills, pulling back road shoulders, and scattering slash on the roadbed;
    - Completely eliminating the roadbed by restoring natural contours and slopes; and
    - Other methods designed to meet the specific conditions associated with the unneeded road.
51. Closure methods may include one or more of the following:
    - Reestablishing former drainage patterns, stabilizing slopes, and restoring vegetation;
    - Blocking the entrance to a road or installing water bars;
    - Removing culverts, reestablishing drainages, removing unstable fills, pulling back road shoulders, and scattering slash on the roadbed; and
    - Other methods designed to meet the specific conditions associated with ML 1 roads.

Alternatives Considered but Eliminated from Further Detailed Analysis

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the Proposed Action provide suggestions for alternative methods for achieving the Purpose and Need. Some of these alternatives may duplicate the alternatives considered in detail or may be determined to be unable to meet the project's Purpose and Need. Alternatives that were considered but dismissed from detailed consideration and the reasons for dismissal are summarized in the following:

Create bike trails along the river

An alternative was considered that would create a series of bike paths/hiking trails along the river in the Odell Pasture (north) section and connect into the Crescent paved path along County Road 61 (Crescent Cutoff). Access to and from County Road 61 to Odell Pasture is limited to the 6100100 road as this National Forest land is surrounded by adjacent private property thus, this alternative was considered but eliminated from further detailed consideration.

Open the area to All-terrain Vehicles (ATV)/motorized traffic

Several commenters suggested that the entire Odell Pasture (north) portion be opened for ATV use. This alternative was considered but eliminated as the Little Deschutes River runs through Odell Pasture (northern portion of project area) and trails would impact the riparian area and sensitive resources resulting in sedimentation to the river and vegetation resource damage. All-terrain vehicles are allowed on open ML 2 roads shown on the Motor Vehicle Use maps (MVUM). Currently the 6100100, 6100200, 9770600, and the 9770700 are available for ATV/motorized use.

Replacing the vehicle bridge at Bridge-out (at north end of Forest Service road 9770)
An alternative was considered to replace the bridge at "bridge-out" so there is a way to cross the Little Deschutes River in the west end of the northern section of the project area. Currently Forest Service road 9770 ends at the Little Deschutes River and is used as a drafting site by the Forest Service, Walker Range FPA, and timber operations. The vehicle bridge, at the north end of the FS road 9970, has been out since the mid 1970's and was only utilized by a small subset of the local population. For a 100 foot, the rough estimate for a single lane bridge ($150K) on driven or drilled steel piles ($90K) with additional railings ($30K), channel protection, bridge abutment and preparation work, the cost would run over $310K. In addition, bridge maintenance and inspections would add additional costs. Thus the cost to build a new bridge in this location versus the benefits gained is not feasible at this time, thus this alternative will not be analyzed further.

Leaving the unauthorized bridge at DS #14 in place
An alternative was considered to leave the unauthorized bridge utilized by OHVs over the Little Deschutes River adjacent to DS #14. The IDT considered but eliminated leaving the bridge due to the deterioration of the bridge structure, lack of footings on either side of the river to properly support the bridge, the erosion caused to the streambanks, it is not built to Forest Service Standards, and no Forest Service system roads access the structure. There is no authorized access to the bridge location on either side of the river and the unauthorized route currently runs through the Riparian Habitat Conservation Area (RHCA). The cost of an OHV bridge, bridge maintenance, and inspections for a bridge not connected to an authorized OHV system is not feasible at this time, thus this alternative will not be analyzed further.

Installing step pools or multiple side channel ponds in the ditch
An alternative was considered to create multiple ponds or step pools within the existing ditch in order to utilize and create side channel habitat. The IDT examined this idea and it was determined that this habitat could be created by obliterating the ditch down the existing channel and thus backing up the water and creating pond-like features. This similar effect is observed in the stream system within the Little Deschutes River and has been effective in producing habitat for Oregon spotted frogs. Thus a full alternative was considered but eliminated, however elements of this design are incorporated into Alternative B- the Proposed Action.

CHAPTER THREE - ENVIRONMENTAL CONSEQUENCES

Cumulative Effects of Past, Present and Reasonably Foreseeable Future Actions

The cumulative effects analysis in this EA is also consistent with the National Environmental Policy Act (NEPA) Regulations (36 CFR 220.4(f); July 24, 2008), which state, in part:

> "CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions. Once the agency has identified those present effects of past actions that warrant consideration, the agency assesses the extent that the effects of the proposal for agency action or its alternatives would add to, modify, or mitigate those effects. The final analysis documents an agency assessment of the cumulative effects of the actions considered (including past, present, and reasonable foreseeable future actions) on the affected environment. With respect to past actions, during the scoping process and subsequent preparation of the analysis, the agency must determine what information regarding past actions is useful and relevant to the required analysis of cumulative effects. Cataloging past actions and specific information about the direct and indirect effects of their design and implementation could in some contexts be useful to predict the cumulative effects of the proposal. The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all individual past actions. Simply because information about past actions may be available or obtained with reasonable effort does not mean that it is relevant and necessary to inform decision making (40 CFR 1508.7)."

The projects listed in Table 5 are those which may contribute to effects in the project area, either ongoing from past activities or from future planned actions. Completed projects are included where the effects are recent enough to still be apparent and similar to those that would be generated from the Upper Little Deschutes Restoration Project. For example, past hydrologic restoration work in the planning area may be considered for cumulative effects. The subsequent resource reports in this EA make determinations about which of these projects may contribute to cumulative effects on resource-by-resource basis.

Table 5. Past, Present, and Reasonably Foreseeable Future Actions

Project/Event Name	General Description of Activities	Status
Region 6 Invasive Plant EIS (2005)	Implements Standards and Guidelines and prevention strategies to manage invasive plant species.	Implementation
Invasive Plant Treatments for the Deschutes and Ochoco National Forests and the Crooked River National Grassland – Final Supplemental EIS (2012)	Supplemental EIS for site-specific treatment of invasive plants at approx. 1,892 sites on the Ochoco and Deschutes NF and Crooked River National Grassland. Methods include herbicides, manual, mechanical, and cultural.	Implementation

Project/Event Name	General Description of Activities	Status
Deschutes and Ochoco National Forests and Crooked River National Grassland Travel Management Project EIS (2011)	Motorized travel in central Oregon would be restricted to designated roads and trails only. Access to dispersed camping would have special provisions to limit access to sensitive areas.	Implementation
Forest-wide Firewood CE (2017)	Encompass entire Deschutes National Forest west of the "owl line."	Implementation
Crescent Roadside Firewood Strategy (2012)	Personal use firewood cutting on approximately 600 miles of (28,800 acres) roadside along open roads (as defined by the Deschutes Motor Vehicle Use Maps) east of the boundary delineated by the 1994 Northwest Forest Plan boundary (commonly known as the Northern spotted owl line).	Implementation
Rim-Paunina EIS (2012)	Vegetation management on approximately 11,236 acre of commercial thinning as well as associated fuels treatments, and 13,491 acres of fuel treatments/prescribed fire.	Implementation. Rim-Paunina units 3010 and 115 are separated from the south and southeast corner of the ULDR project area by 0.15 miles. Some effects maybe overlapping.
Three Trails OHV Project (2010)	142 miles of designated motorized OHV trails over a 93,016 acre project with the focus on areas that are currently being most heavily used by riders. Fifty-six to 94 miles of user-created trails would be rehabilitated.	Implementation. Part of the eastern border of the Rivers portion of the Three Trails OHV project area is adjacent to the southwest corner of Upper Little Deschutes Restoration Project (south section), but separated by Highway 58. Some effects maybe overlapping.
BLT EIS (2008)	Commercial and small-tree thinning of forested stands, prescribed burning, piling and disposal of activity-generated slash, and construction of 9.8 miles of temporary roads over 7,499 acres within the analyzed vegetation management 80,000-acre BLT project area.	Timber activities are completed and included in the existing condition. Fuels work/underburning is still being implemented.

Wildlife

Species Summary

Proposed (P), Threatened (T), Endangered (E) Species	Alternative A (No Action)	Alternative B (Proposed Action)
Northern spotted owl (*Strix occidentalis*) (T)	NE	NE
Northern spotted owl Critical Habitat	NE	NE
Oregon spotted frog *(Rana pretiosa)* (T)	NE	LLA
Oregon spotted frog Critical Habitat	NE	NLAA
Gray wolf (*Canis lupus*) (E)	NE	NE
North American Wolverine *(Gulo gulo)* (P)	NE	NE
Pacific fisher *(Pekania pennanti)*	NE	NE

NE = No Effect;
MEBE = May Effect, likely to Beneficially Effect. (BA must be completed for concurrence on benefits)
NLLA = May Effect, Not likely to Adversely Affect (must also meet PDCs, BA must be completed for concurrence on benefits);
NLJ = Not Likely to Jeopardize (Proposed species only)
LLA = Likely to Adversely Affect (BA must be completed and consulted).

R6 Sensitive Species (Federal Candidates for listing*)		
Northern bald eagle *(Haliaeetus leucocephalus)*	NI	NI
Bufflehead *(Bucephala albeola)*	NI	NI
Harlequin *(Histrionicus histrionicus)*	NI	NI
Tricolored blackbird *(Agelaius tricolor)*	NI	NI
Yellow rail *(Coturnicops noveboracensis)*	NI	NI
Greater (Western) sage grouse *(Centrocercus urophasianus phaeios)*	NI	NI
Lewis' woodpecker *(Melanerpes Lewis)*	NI	NI
White-headed woodpecker *(Picoides albolarvatus)*	NI	MIIH
Northern waterthrush *(Parkesia noveboracensis)*	NI	BI
Horned grebe *(Podiceps auritus)*	NI	NI
Tule goose *(Anser albifrons elagasi)*	NI	NI
Sierra Nevada red fox *(Vulpes vulpes necator)*	NI	NI
Townsend's big-eared bat *(Corynorhinus townsendii)*	NI	NI
Pallid bat *(Antrozous pallidus)*	NI	NI
Spotted bat *(Euderma maculatum)*	NI	NI
Fringed myotis *(Myotis thysanodes)*	NI	NI
Columbia spotted frog *(Rana luteiventris)*	NI	NI
Crater Lake tightcoil *(Pristiloma arcticum crateris)*	NI	BI
Shiny tightcoil *(Pristiloma wascoense)*	NI	BI
Dalles Mountainsnail (*Oreohelix variablilis*)	NI	NI
Dalles Hesperian (*Verspericola Columbiana depressus*)	NI	NI
Silver-bordered fritillary *(Boloria selene)*	NI	BI
Western bumblebee *(Bombus occidentalis)*	NI	BI
Morrisoni bumblebee (*Bombus morrisoni*)	NI	BI
Suckley cuckoo bumblebee (*Bombus suckleyi*)	NI	BI

NI = No Impact;
MIIH = May impact individuals or habitat, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species;
BI = Beneficial Impact

Summary Conclusions for Threatened, Endangered, and Proposed Species and Federal Candidates

1. The project is outside the range of the **Northern Spotted owl**, therefore it would have **"No Effect"**, for the northern spotted owl or its critical habitat. Consultation with US Fish and Wildlife Service is not necessary.

2. The project affects vegetation and hydrology in habitat **Oregon spotted frog** currently occupies. It provides a broader connection to the floodplain, completely, partially, and/or seasonally re-connects selected oxbows, re-waters wetlands and provides for retention of water longer into the summer season. All of which would increase the amount and quality of Oregon spotted frog habitat. Pulling dispersed recreation sites out of the riparian, closing unauthorized bridges, trails and roads along with rehabilitating these sights improves habitat and decreases recreational disturbance. However, since equipment would be working in occupied habitat, capture and relocation of frogs during implementation of the project **"May Effect, Likely to Adversely Affect"** Oregon spotted frog in the short term, increasing quantity and quality for a beneficial effect in the long term. The ULDR project does not meet the Programmatic BA Project Design Criteria, as such consultation with US Fish and Wildlife Service is necessary. Consultation with US Fish and Wildlife Service is ongoing. An in-depth effects analysis is in progress in a separate Biological Analysis (BA).

3. The project affects vegetation and hydrology within **Oregon spotted frog critical habitat**. It would increase breeding habitat through broader connection to the floodplain, and other primary constituent elements through re-watering of oxbows, creating or deepening existing ponds within the oxbows and ensuring a flow of water to the Odell pasture pond. All of which would increase the amount and quality of Oregon spotted frog habitat. Reducing the number of dispersed recreation sites within the CHU, closing unauthorized bridges, trails and roads along with rehabilitating these sights improves habitat and decreases disturbance. Implementation of the project alters the vegetation and hydrology within the CHU therefore, it **"May Effect, Not Likely to Adversely Affect"** Oregon spotted frog Critical Habitat Unit 9. As of May 15, 2019 consultation with US Fish and Wildlife Service is ongoing and will be completed prior to a signed decision. An in-depth effects analysis of the project on critical habitat will be included in the Biological Analysis (BA) for the Oregon spotted frog.

4. **Gray wolves** generally use this area as a travel corridor. There are no current resident wolves on the Crescent Ranger District. The ULDR project alters big game habitat by increasing consolidated blocks of habitat through road closures and obliteration. It also improves foraging habitat along riparian areas increase quality and quantity of forage for big game, contribute to a positive trend in viability of big game on the Deschutes National Forest. Disturbance from implementation would temporarily change how big game use the project area pushing them away from riparian areas during the day. Changes to big game use patterns and disturbance from implementation would be local and minor and would not alter how gray wolf would utilize the project area. Implementation would result in a determination of **"No Effect"** to the gray wolf, as such, consultation with US Fish and Wildlife Service is not necessary.

5. **Wolverine** are unlikely to utilize the project area. The ULDR project would not alter use of the area by wolverine. Implementation of the project would result in a determination of **"No Effect"** on the wolverine. As such, consultation with US Fish and Wildlife Service is not necessary.

6. **Pacific Fisher** are unlikely to utilize the project area. The ULDR project would not alter use of the area by fisher. Implementation of the project would result in a determination of **"No Effect"** on the Pacific Fisher. As such consultation with US Fish and Wildlife Service is not necessary.

Summary Conclusions for R6 Sensitive Species.
The project would have **"No Impact"** to Sierra Nevada red fox, yellow rail, greater sage grouse, American peregrine falcon, Lewis's woodpecker, horned grebe, Tule goose, Columbia spotted frog, Dalles mountainsnail and Dalles hesperian with the implementation of the proposed project as they are not present nor have habitat within the project area.

There is no maternal or roosting habitat for Townsend's big-eared bat, pallid bat, spotted bat, and fringed myotis potential within the project area. There are no known sightings or detection of these species on the Crescent Ranger District. Since most bats are known to forage in riparian/wetland areas and over water sources there is potential foraging habitat within the project area. Since implementation of the project would occur during the day and bats forage at night, there no change of how these bats may utilize potential foraging habitat in the project area. Implementation of the project would have **"No Impact"** to Townsend's big-eared bat, pallid bat, spotted bat, or fringed myotis.

With an initial decrease in secondary nesting habitat, from lodgepole removal. Implementation of the ULDR project "**May impact individuals or habitat, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species**" of the northern waterthrush. Over the long term riparian restoration actions would increase willow, and sustainable recreation and transportation would decrease incidental loss and disturbance of occupied and potential habitat within the ULDR project area. These actions would provide a beneficial impact with the potential to increase the population of northern waterthrush and potential willow nesting habitat on the Little Deschutes River.

The ULDR project would increase quality and quantity habitat for the tightcoils, butterflies and bumblebees through increased wetland habitat, hardwoods, diversity of flowering species and a decrease in lost and disturbance of potential habitat. Implementation of the ULDR project would have a **"Beneficial Impact"** to the Crater Lake tightcoil, shiny tightcoil, silver-bordered fritillary, western bumblebee, Morrisoni bumblebee and Suckley's cuckoo bumblebee.

Introduction
The proposed actions are not broad scale across a large area but focused on specific areas within the project area. While existing conditions may cover a broader area, the Zone of Influence for discussion of direct, indirect and cumulative effects from treatments is bounded by the project area for all species. The analysis area is the project area for all species and will be referred to as the project area within the effects discussion. This wildlife section includes the summary for Threatened, Endangered and Sensitive Species (TES), Management Indicator Species (MIS), Birds of Conservation Concern (BCC), High Priority Shorebirds, and Landbird Strategic Plan Focal Species (LBFS). The wildlife resource reports are available at the Crescent Ranger District. Since the project area is outside the range of the northern spotted owl and the Northwest Forest Plan there is no section on Survey and Manage. For additional details, assumptions, and methodology refer to the Wildlife Resource Report.

Biological Evaluation

This Biological Evaluation (BE) has been prepared in compliance with the requirements of Forest Service Manual (FSM) 2630.3/ FSM 2670-2671, FSM 2672.4, FSM W.O. Amendment 2700-2009-1,

and the Endangered Species Act of 1973 (Subpart B: 402.12, Section 7 Consultation, as amended) on actions and programs authorized, funded, or carried out by the Forest Service to assess their potential for effects on Threatened and Endangered species and species Proposed for federal listing (FSM 2670.1). Species classified as sensitive by the Forest Service are to be considered by conducting biological evaluations to determine potential effects of all programs and activities on these species (FSM 2670.32). Threatened, Endangered, and Proposed species were analyzed using the July 2016 USFWS list. Sensitive species were analyzed using the March 2019 R6 Regional Forester's Sensitive Species list. The BE is a documented review of Forest Service activities in sufficient detail to determine how a proposed action may affect sensitive wildlife species. The document becomes part of the analysis file.

This Biological Evaluation is a seven-step process[11] to identify threatened, endangered, and sensitive wildlife species that may be associated with the project, and to evaluate any impacts the project may have to those species. The biological evaluation process for wildlife species, which may occur within the project area on the Crescent Ranger District and is summarized in Table 6. Field surveys were not completed or required for all species in this evaluation where the action does not include ground-disturbing activities that may affect their habitat. The analysis area was evaluated for potential habitat and species presence using District wildlife sightings records, District Geographical Information System (GIS) vegetation and habitat data layers, known locations of TES species, and District personnel knowledge of the river corridor. Species specific discussions are included after Table 6. All Threatened (T), Endangered (E), or Proposed (P) that are present and/or have potential habitat in the analysis area will be further analyzed. Only R6 Sensitive species that are present and/or have potential habitat will be further analyzed.

After a review of wildlife observation records, habitat requirements, and habitat conditions present in the analysis area, it was determined the following Threatened, Endangered, Proposed or Region 6 Sensitive wildlife species are **known to occur or have suitable habitat present** in the analysis area: Oregon spotted frog, gray wolf, northern bald eagle, bufflehead, white-headed woodpecker, northern waterthrush, Townsend's big-eared bat, pallid bat, spotted bat, fringed myotis, Crater Lake tightcoil, shiny tightcoil, silver-bordered fritillary, western bumblebee, Dalles Mountainsnail, and Dalles Hesperian.

The remaining TES species that are **not present** nor have suitable habitat present or in close proximity to the analysis area include: northern spotted owl, wolverine, pacific fisher, harlequin duck, tricolored blackbird, yellow rail, greater sage grouse, American peregrine falcon, Lewis's woodpecker, horned grebe, Tule goose, Pacific fisher, Sierra Nevada red fox, and Columbia spotted frog.

[11] Step 6, Mitigation Measures to minimize effects, are not included in the table but are part of the description of the project and listed in Wildlife Design Criteria and Mitigation Measures in Chapter 2.

Table 6. Summary of Biological Evaluation Steps 1-5 and 7 (Step 6[12])

Step 1. Identification of listed, proposed and sensitive species	Step 2. Description of habitat and presence of habitat and/or species		Step 3. Adverse Effect or Conflict	Step 4. Cumulative effects/ Significance	Step 5. Determination and Step 7. Need for consultation of TE and P only
Species to consider	**Habitat Used**	**Species or Habitat present**	**Species or Habitat Affected or Impacted by Project**		
Proposed (P), Threatened (T), Endangered (E) Species					
Northern spotted owl (*Strix occidentalis*) (T) And Critical Habitat	Nesting, roosting, foraging habitat consist of late and old structure, multi-story stands **Project is outside the range of this species**	No	No	None	NE No consultation
Oregon spotted frog (*Rana pretiosa*) (T)	Highly aquatic. Breeding -requires emergent wetlands - sedge fens, riverine over-bank pools beaver ponds. Post-breeding - permanent water within wetland, riverine, and lacustrine habitats. Overwinter - deep ponds, or well oxygenated springs	Yes	Disturbance to potential harm from equipment working in occupied habitat	None	LLA Consultation Required
Critical Habitat Unit 9			Alteration of vegetation and hydrology	None	NLAA Consultation Required
Gray wolf (*Canis lupus*) (E)	Habitat generalist dependent on remote areas with sufficient big game species available year round.	Yes	No	None	NE No Consultation
Wolverine (*Gulo gulo*) (P)	Wide variety of habitats, limiting factor is breeding habitat in high-elevation, alpine habitats containing sufficient snow depth during the spring denning period	No	No	None	NE No consultation
Pacific fisher (*Pekania pennanti*) (P)	Dense forest with a coniferous component, large snags or decadent live trees and logs for denning and resting, and complex physical structure near the forest floor to support prey	No	No	None	NE No consultation
R6 Sensitive Species (*Federal Candidates for listing)					
Northern bald eagle *(Haliaeetus leucocephalus*)	Over-mature ponderosa pine or mixed conifer forest for nesting or with roosting in proximity to foraging area consisting of fish-bearing lakes and/or rivers	Yes	Potential Effects	None	NI
Bufflehead (*Bucephala albeola*)	Utilizes tree cavities in dense forest close to lakes and ponds, low gradient rivers	Yes	Potential Effects	None	NI

[12] Step 6 is mitigation measures to minimize effects. They can be found in the Mitigation and Design Criteria section.

Step 1. Identification of listed, proposed and sensitive species	Step 2. Description of habitat and presence of habitat and/or species		Step 3. Adverse Effect or Conflict	Step 4. Cumulative effects/ Significance	Step 5. Determination and Step 7. Need for consultation of TE and P only
Species to consider	**Habitat Used**	**Species or Habitat present**	**Species or Habitat Affected or Impacted by Project**		
Harlequin (*Histrionicus histrionicus*)	Nest along fast-flowing rivers and mountain streams	No	No	None	NI
Tricolored blackbird (*Agelaius tricolor*)	Nests in undisturbed fresh-water marshes of cattails, tules, bulrushes and sedge, or in thickets of willows or other shrubs	No	No	None	NI
Yellow rail (*Coturnicops noveboracensis*)	Nest in marshes or wet meadows with an abundance of sedges and an average water depth of 7 cm.	No	No	None	NI
Greater sage grouse (*Centrocercus urophasianus phaeios*)	Sagebrush communities with a mixture of sagebrush, meadows and aspen.	No	No	None	NI
Lewis's woodpecker (*Melanerpes Lewis*)	Open ponderosa pine habitats or burned ponderosa pine forest created by stand-replacing fires. Require large snags in an advanced stage of decay, or with existing cavities	No	No	None	NI
White-headed woodpecker (*Picoides albolarvatus*)	Open old growth ponderosa pine forest with little shrub cover and a mosaic of denser areas. Two pine species such as ponderosa and sugar pine provide a winter seed source	Yes	Potential Impacts	None	MIIH
Northern waterthrush (*Parkesia noveboracensis*)	Nests in dense riparian thickets of willow, alder, and/or lodgepole pine with a willow component adjacent to slow moving water	Yes	Potential Impacts	None	BI
Horned grebe (*Podiceps auritus*)	Nest in lakes and ponds with tall vegetation or marshy habitats	No	No	None	NI
Tule goose (*Anser albifrons elagasi*)	Marshes and wetland habitats	No	No	None	NI
Sierra Nevada red fox *(Vulpes vulpes necator)*	High elevation, alpine or subalpine forest	No	No	None	NI

Step 1. Identification of listed, proposed and sensitive species	Step 2. Description of habitat and presence of habitat and/or species		Step 3. Adverse Effect or Conflict	Step 4. Cumulative effects/ Significance	Step 5. Determination and Step 7. Need for consultation of TE and P only
Species to consider	**Habitat Used**	**Species or Habitat present**	**Species or Habitat Affected or Impacted by Project**		
Townsend's big-eared bat (*Corynorhinus townsendii*)	Maternity and hibernation takes place in caves and mine tunnels, roosts in cavities in caves, buildings, bridges and mines..	Yes	No	None	NI
Pallid bat (*Antrozous pallidus*)	Found in arid deserts, steppe and grasslands, less frequently in dry open oak or ponderosa forest. Roosts in rock crevices less common in buildings, bridges, caves, live tree and snags.	Yes	No	None	NI
Spotted bat (*Euderma maculatum*)	Rely on caves, cracks, and crevices in tall cliffs for roosting. Foraging is variable from marshes, meadows, riparian to open ponderosa pine.	Yes	No	None	NI
Fringed myotis (*Myotis thysanodes*)	Occur primarily at middle elevations in desert, riparian, grassland, and woodland habitats. Roosts in caves, mines, rock crevices buildings, bridges and other protected sites. Forage close to the vegetative canopy	Yes	No	None	NI
Columbia spotted frog (*Rana luteiventris*)	Similar to Oregon spotted frog require a mosaic of emergent wetlands, permanent water and deeper water **Project is outside the range of this species**.	No	No	None	NI
Crater Lake tightcoil (*Pristiloma arcticum crateris*)	Riparian habitats with permanent surface moisture	Yes	Potential effects	None	BI
Shiny tightcoil (*Pristiloma wascoense)*	Moist microsites primarily under deciduous vegetation, and/or shaded basalt cliff with talus with riparian influence	Yes	Potential effects	None	BI
Dalles Mountainsnail (*Oreohelix variablilis*)	Associated with seeps and springs in the open and dry areas, north-facing large basalt talus	No	No	None	NI
Dalles Hesperian (*Vespericola Columbiana depressus*)	Seeps and Springs	No	No	None	NI

Step 1. Identification of listed, proposed and sensitive species	Step 2. Description of habitat and presence of habitat and/or species		Step 3. Adverse Effect or Conflict	Step 4. Cumulative effects/ Significance	Step 5. Determination and Step 7. Need for consultation of TE and P only
Species to consider	**Habitat Used**	**Species or Habitat present**	**Species or Habitat Affected or Impacted by Project**		
Silver-bordered fritillary (*Boloria selene*)	Suitable habitat consists of mostly wet meadows, marshes, bogs and more open parts of shrubbier wetlands with violet species for the caterpillar stage and nectar sources such as composite flowers for the adult	Yes	Potential effects	None	BI
Western bumblebee (*Bombus occidentalis*)	Areas with a diverse assemblage of native flora such that flowers would be constantly available throughout the active season of April to September	Yes	Potential effects	None	BI
Morrisoni bumblebee (*Bombus morrisoni*)					
Suckley cuckoo bumblebee (*Bombus Suckleyi*)					

BEST AVAILABLE SCIENCE

This report has considered and applied the best science available; including papers, reports, literature reviews, review citations, peer reviews, science consistency reviews, and results of ground-based observations. Data layers from the Forest Service Geographic Information Systems and various Resource Management data bases were utilized in the analysis. NatureServe, http://explorer.natureserve.org/index.htm, was often used for population trends and/or species habitat needs. It is an authoritative source of current, comprehensive, quality biodiversity data. Best available science and professional judgment was used to determine the analysis area, species, or habitat presence and effects.

AFFECTED WILDLIFE

Threatened, Endangered, and Proposed Species

Northern Spotted Owl, *Federal Threatened, MIS*

The project is outside the range of the northern spotted owl, therefore it would have **"No Effect"** for the northern spotted owl or its critical habitat.

Oregon Spotted Frog (*Rana pretiosa*) and Critical Habitat

The Oregon spotted frog was proposed for listing as a threatened species under the Endangered Species Act on August 29, 2013. On August 28, 2014, the USFWS listed the frog as a Threatened species under the Endangered Species Act (Fed. Reg. 2014). Critical Habitat was designated on May 11, 2016. The 2016 Critical Habitat Unit (CHU) rule included designation of approximately 65,038 acres and 20.34 river miles. On the Crescent Ranger District, there are two CHUs, CHU 8B and CHU 9. Odell Creek, several miles east of its outlet at Odell Lake, is part of CHU 8B: Upper

Deschutes River above Wickiup Dam. Crescent Creek, below the dam on Crescent Lake, flows into the Little Deschutes River all of which is part of CHU 9: Little Deschutes River.

A brief summary of Oregon spotted frog life history and Critical Habitat is given below. For more detailed information on the Oregon spotted frog life history, Critical Habitat Units and Recovery see *Federal Register Vol. 78 No. 168 August 29, 2013 p29354 (Fed. Reg. 2016)* and the *Joint Aquatic and Terrestrial Programmatic Biological Assessment for Federal Lands within the Deschutes and John Day River Basin's Administered by the Deschutes and Ochoco National Forest* (2014).

Conditions required for the Oregon spotted frog life cycle include shallow water areas for egg and tadpole survival, perennially deep, moderately vegetated pools for adult and juvenile survival in the dry season, and perennial water for protecting all age classes during cold weather (Watson et al. 2003). The Oregon spotted frog inhabits emergent wetland habitats in forested landscapes, although it is not typically found under forest canopy. This is the most aquatic native frog species in the Pacific Northwest, as all other species have a terrestrial life stage. It is almost always found in or near a perennial body of water, such as a spring, pond, lake, sluggish stream, irrigation canal, or roadside ditches (Federal Register 2013b).

Primary constituent elements of the physical and biological features necessary for the management and recovery of the species include:

Primary constituent element 1 - Nonbreeding (N), Breeding (B), Rearing (R), and Overwintering Habitat (O). Ephemeral or permanent bodies of fresh water, including, but not limited to natural or manmade ponds, springs, lakes, slow-moving streams, or pools within or oxbows adjacent to streams, canals, and ditches.

Primary constituent element 2 - Aquatic movement corridors. Ephemeral or permanent bodies of fresh water.

Primary constituent element 3 - Refugia habitat. Nonbreeding, breeding, rearing, or overwintering habitat or aquatic movement corridors with habitat characteristics (e.g., dense vegetation and/or an abundance of woody debris) that provide refugia from predators (e.g., nonnative fish or bullfrogs).

Threats to the species' habitat include loss of wetlands; changes in hydrology due to construction of dams; human-related alterations to seasonal flooding, or loss of beaver; changes in vegetation due to succession and encroachment, poor water quality, or livestock grazing (in some circumstances); development most markedly residential and commercial; and predation with the introduction of non-native plant and animal species.

Pre-field Review

There are four known Oregon spotted frog sites and three known breeding locations associated with oxbows and ponds along the Little Deschutes River, within the project area. The major cluster of breeding sites occurs upstream of where Forest Service Road 61 crosses the Little Deschutes River, west of Crescent, OR. Egg mass surveys, conducted at this location between 2006 and 2017 by USGS and the Forest Service have yielded counts ranging between 11 and 53 egg masses. The high count of 53 egg masses was observed in 2016 during an intensive survey effort. Other sites have lower population levels resulting in 1-11 egg masses. The floodplain areas associated with these breeding sites along the Little Deschutes River consists of primarily willow (*Salix* spp.), with lodgepole pine (*Pinus contorta*) on the surrounding uplands.

There is approximately 280 acres of CHU 9 within the project area. The USFWS wetlands GIS layer classification of emergent wetlands was used to determine potential Oregon spotted frog habitat. There is approximately 20 acres of emergent wetlands within CHU 9 and a total of 25 acres within

the project area. There are three dispersed sites located entirely within the CHU, DS #2, 5, and 17. Fourteen dispersed sites are partially within the CHU. All sites are within riverine, freshwater forested/shrub wetland and/or upland forest. None are currently within mapped freshwater emergent wetland. Refer to Table 7.

Table 7. Dispersed Sites within Oregon Spotted Frog CHU9

Site #*	Within OSF CHU	Wetland Type
Northern Portion		
DS #1	Partially	Riverine, Freshwater Forested Wetland and Upland Forest
DS #2	Yes	Riverine, Freshwater Forested Wetland
DS #3	Partially	Riverine, Upland Forest
DS #4	Partially	Riverine, Upland Forest
DS #5	Yes	Freshwater Forested Wetland and Upland Forest
DS #6	Partially	Freshwater Forested Wetland and Upland Forest
DS #7	Partially	Freshwater Forested Wetland and Upland Forest
DS #8	No	Upland Forest
DS #9	Partially	Freshwater Forested Wetland and Upland Forest
DS #10	No	Upland Forest
DS #11	Partially	Riverine, Freshwater Forested Wetland and Upland Forest
DS #20	Partially	Freshwater Forested Wetland and Upland Forest
Dump #1	No	Upland Forest
Dump #2	No	Upland Forest
Southern Portion		
DS #12	No	Upland Forest
DS #13	Partially	Riverine, Freshwater Forested Wetland and Upland Forest
DS #14	Partially	Freshwater Forested Wetland and Upland Forest
DS #15	Partially	Freshwater Forested Wetland and Upland Forest
DS #16	Partially	Freshwater Forested Wetland and Upland Forest
DS #17	Yes	Freshwater Forested Wetland
DS #18	Partially	Freshwater Forested Wetland and Upland Forest
DS #19	Partially	Freshwater Forested Wetland and Upland Forest
* Sites were defined by 100 foot buffer from center of site to include full area of disturbance. The campsite itself may be outside of the CHU 9, but a portion of the area of disturbance may be in.		

Survey History

Spring visual encounter surveys (Table 8) for breeding frogs and egg masses were conducted in 2015, 2016, and 2017 using the 2010 Pearl et al. protocol. Not all sites were covered every year. The number of egg masses varied at each site each year with a low of 0 and high of 53 egg masses with the highest number at the Odell Pasture location in 2016. Survey data are on file at the Crescent Ranger District.

Table 8. Oregon Spotted Frog Breeding Survey Results

Survey Area	Number of Egg Masses (Number of Adults in parenthesis)						
	2012	2013	2014	2015	2016	2017	2018
100 road and Odell Pasture Pond	27	36	4	4	53 (2)	1	13
Little Deschutes Dogleg 1	NA	0	NA	NA	0	NA	NA
Little Deschutes Dogleg 2	NA	0	NA	NA	0	NA	NA

Survey Area	Number of Egg Masses (Number of Adults in parenthesis)						
	2012	2013	2014	2015	2016	2017	2018
Little Deschutes Dogleg 3	NA	2	NA	NA	23 (12)	17(4)	40 (4)
Total Egg Masses	27	38	4	4	76	18	53
Breeding adults based on 2/egg mass		76			152		106
NA = Not surveyed that year.							

Direct, Indirect, Cumulative Effects and Determination

Alternative A - No Action

Current Oregon spotted frog locations are associated with wetland areas adjacent to the Little Deschutes River, side channels with deep ponds, or ditches and ponds found in Odell Pasture. During dry years these ponds dry up and frogs retreat to side channels, ditches, or the river. Moving to the river puts Oregon spotted frogs at greater risk of predation.

Vegetative succession without fire, over time, is converting wetlands and shrub wetlands to forest. Lodgepole pine is currently encroaching into riparian areas and wet meadows. The increased shading from these trees reduces solar radiation in shallow water reducing warm sites required for breeding by Oregon spotted frogs (Pearl 1999). Over time these trees have reduced breeding habitat along the Little Deschutes River.

Dispersed recreational sites continue to expand and degrade occupied and potential Oregon spotted frog habitat through vegetation removal, trampling, human presence, and recreational activities. Sites DS #2, 5, and 17 as well as both unauthorized bridges are within the CHU. Sites DS #1, 3, 4, 6, 7, 9, 11, 13, 14, 15, 16, 18, 19 and 20 are partially within the CHU. All recreation sites have trails that lead down to the river, many going through potential Oregon spotted frog habitat. Only DS #2 and trails from DS #9 go through known occupied habitat. Streambanks are broken down and many wet areas are trampled degrading the function of the CHU.

The current road system provides access to these dispersed sites where unauthorized routes proceed to access points to the river. There is evidence of motorized vehicle use within potential frog habitat at the bridge site and occupied frog habitat at Odell Pasture. Rutting riparian features such as ponds and wetlands, damages potential habitat for the Oregon spotted frog within the CHU.

Alternative B – Proposed Action

Proposed stream structures, consisting of a single logs, multiple logs, or beaver dam analog structures would be designed to increase water levels to help reconnect historic wetland and side channels to the river and/or provide a base from which beavers could establish a dam. Increased water levels would increase all life cycle habitats (breeding, summer, and overwinter) for Oregon spotted frog.

Structures increasing water in side channels or oxbows would vary depending availability of materials, access for equipment and habitat that it currently provides. Different strategies and structures used on the side channels and oxbows created different habitats. Where habitat already exists no changes would be made; where ponds exist a structure to divert at high flows would provide aquatic connectivity to that site. In side channels or oxbows where ponds are not already existing, excavating ponds would provide rearing, nonbreeding, summer and overwintering habitat. Not all oxbows or side channels would be altered. Breeding habitat would increase where structures are placed along the edges of the side channels, sedge and the floodplain during high and low flow years.

Across the project area water levels would be retained longer increasing the length of time rearing habitat is available; potentially increasing survival of tadpoles and juveniles.

Side channels that become connected year round during normal flow years would provide Oregon spotted frog summer/winter habitat that fish would also have access to. While frogs would utilize this habitat, the presence of fish may be a deterrent to establishing a large population at that site. Configurations of shallow water habitat with hiding cover would decrease predation at these sites. Side channels connected only during high flow would be less likely to retain fish when water levels drop and the site would no longer be connected to the river. Frogs would be more likely to become established and fully utilize that habitat.

Oregon spotted frogs currently occupy several sites where equipment would be working at, including Odell Pasture and Dogleg 3. The Dogleg 3 site includes a small wetland and side channels that are disconnected except at high flows. They also dry up during drought years. Other sites include the unauthorized water diversion ditch, a historic pond, and a small wetland areas adjacent to the Little Deschutes River. The ditch, pond, and wetland have dried up completely the last two years. While efforts to relocate the frogs during the restoration process would take place, there would be potential that not all frogs would be found. Actions from the disturbance and relocation has the potential to harm and/or kill frogs not located. To minimize the number of frogs harmed, work would be completed during the driest conditions possible, generally after August 1.

Project-wide increased water elevations to historic levels would increase all life cycle habitats (breeding, rearing, summer and overwinter) within the CHU 9 for Oregon spotted frog. Increases include approximately 12 acres of breeding habitat; eight acres of breeding/rearing habitat; six acres of non-breeding/wintering habitat and four acres of wintering habitat. Spring runoff in normal water years create additional breeding habitat within the floodplain. With the return to normal water elevations, breeding habitat created by typical spring runoff may expand further into the floodplain. Post-implementation, water levels decrease to summer base flows there would be an increase of approximately 30 acres of life cycle habitats.

All instream structure placement and unauthorized bridge removals takes place within the Little Deschutes River Critical Habitat Unit (CHU 9). Areas of impact includes a 300 ft. buffer around each location where structures would be placed. This buffer includes the maximum distance lodgepole pine would be transported and multiple structures created within a given location. The impact buffer over estimates total acres, as most sites may have sufficient material within the first 50-150 feet. Restoration alterations within CHU 9, with these actions, would occur on approximately 195 acres or 2% of the total CHU 9 acres (11,367). Impacts would be short-term and include equipment movement crushing vegetation, uprooting trees, disturbance of soil, people trampling of vegetation, and transport of trees for structure by equipment and/or people.

There are approximately 244 acres of lodgepole pine removal proposed in stringer meadows and aspen stands. Approximately 125 acres are within the CHU. Within the CHU, lodgepole treatments occur within approximately 17 acres in emergent wetlands, 106 acres within shrub/forested wetlands, and two acres within uplands. Lodgepole pine removal in these areas would ensure there is sufficient solar radiation to warm the waters for breeding, improving 17 acres of existing breeding habitat and potentially converting 106 acres of shrub/forested wetland to emergent or shrub wetlands thereby increasing breeding habitat. High flows already exceed bank levels during good water years. This project would retain water longer into the summer providing for all life stages, especially the critical rearing. Overall results consist of increasing complexity of side channels, ponds, wetlands, and meadows within the project area.

Lodgepole pine removal with piling and subsequent burning would be completed when sites are dry or after August 1st to minimize Oregon spotted frog exposure to activities. There is proposed lodgepole pine removal in and/or adjacent to all occupied sites, but impacts would be minimal. As seen in the implementation of Big Marsh restoration, contract thinning crews avoid walking in standing water, and generally walk in single file to and from the work sites along the same route. Disturbance of OSF would be minimal, and short term if at all.

Defining the limits of 14 sites through bouldering, bollards, logs and/or revegetating, would reduce the footprint of dispersed campsites away from the riparian vegetation and the river. Structures used to define sites would be outside of riparian vegetation. Restoration work at these sites would occur when the sites are dry, or at their driest in August/September when frogs are not present. If planting of native vegetation is necessary it would take place in the spring and may cause disturbance to Oregon spotted frog individuals in adjacent habitat. These actions along with planned visitor education and monitoring would decrease impacts of vegetation removal, sedimentation, and disturbance to Oregon spotted frog habitat.

Untreated dispersed campsites #3 and #4 disturbance areas would remain partially within the CHU 9, but are not currently in, or adjacent to Oregon spotted frog habitat. Reducing the size of the 14 dispersed campsites would remove 10 disturbance areas out of the CHU and restore habitat. DS #2, #5 and #17 would still be within the CHU, but with a reduced footprint. DS #1 is outside the CHU, but the site disturbance area would continue to overlap the CHU and an occupied site.

None of the dispersed campsites would be completely closed and rehabilitated, but access and resource impacts would be reduced. All sites would be monitored to determine if resource damage was reoccurring and actions, as previously mentioned, would be taken to mitigate impacts. Retaining/planting willows and sedges within shallow/seasonally inundated areas would provide escape habitat for all life stages. A vegetative buffer would develop between disperse sites, the river and associated wet areas. Sources of sedimentation and vegetative damage of Oregon spotted frog habitat would be limited to fishing footpaths adjacent to the river. Increased water levels from riparian restoration actions could alter recreational use around dispersed sites closest to the river as well as develop habitat in or adjacent to them.

The proposed action decommissions approximately 232 ft. of unauthorized routes from sites DS #1, #2 and #14, making them walk in only sites. There would be an additional 1.25 miles of road within 100 feet of the CHU 9 that would also be decommissioned, reducing access to the CHU. Decommissioned routes may temporarily increase sedimentation into the meadow from runoff until vegetation has reestablished. Route decommissioning and/or rehabilitation would reduce motorized access to the CHU and potential Oregon spotted frog habitat. There would remain approximately 0.9 miles of road opened within 100 feet of the CHU. Within the CHU there would be no open roads. Equipment adding drainage or stabilizing slopes within or adjacent to the riparian area would occur when conditions are dry. No frogs would be in or adjacent to the work area. If planting is needed the work would be completed in the spring, potentially resulting in disturbance to Oregon spotted frog within the planting area.

Future user-created roads would be rehabilitated as they are found utilizing the same methods described in the proposed action. Impacts of recreation to the CHU and Oregon spotted frog habitat would be reduced through monitoring and reacting to recreational encroachment in an expedited manner.

Cumulative Effects
Overlapping past actions are taken into account in existing condition. There are no ongoing or future projects that overlap in time and space with the proposed project that would impact the Oregon spotted frog or their habitat. There would be no cumulative effects.

Conclusion and Determination
The primary results of the proposed project would alter vegetation and water levels. The raised water level and vegetation changes would improve Oregon spotted frog breeding habitat by increasing solar radiation to existing breeding habitat and increasing the amount of freshwater emergent vegetation wetlands. The project would also increase complexity of the river through additional wetted side channels, ponds, and wetlands. Overall increasing life cycle habitat by 30 acres providing for all life stages throughout the 280 acres of CHU, would increase the functionality of this portion of the CHU. While closing roads and reducing the size of recreation sites would decrease impacts to habitat, disturbance would likely continue as access by non-motorized means is not restricted.

The physical implementation of the project, through equipment operation in occupied habitat, would harm some Oregon spotted frogs through disturbance, injury or death. The project determination is **"May Effect Likely to Adversely Affect"** the Oregon spotted frog during implementation and provide beneficial effects with increases in quantity and quality of habitat. The project "**May Effect Not Likely to Adversely Affect**" the CHU 9 through alteration of vegetation and hydrology. Over the long term the project would increase life cycle habitats increasing the CHU's ability to provide for the Oregon spotted frog.

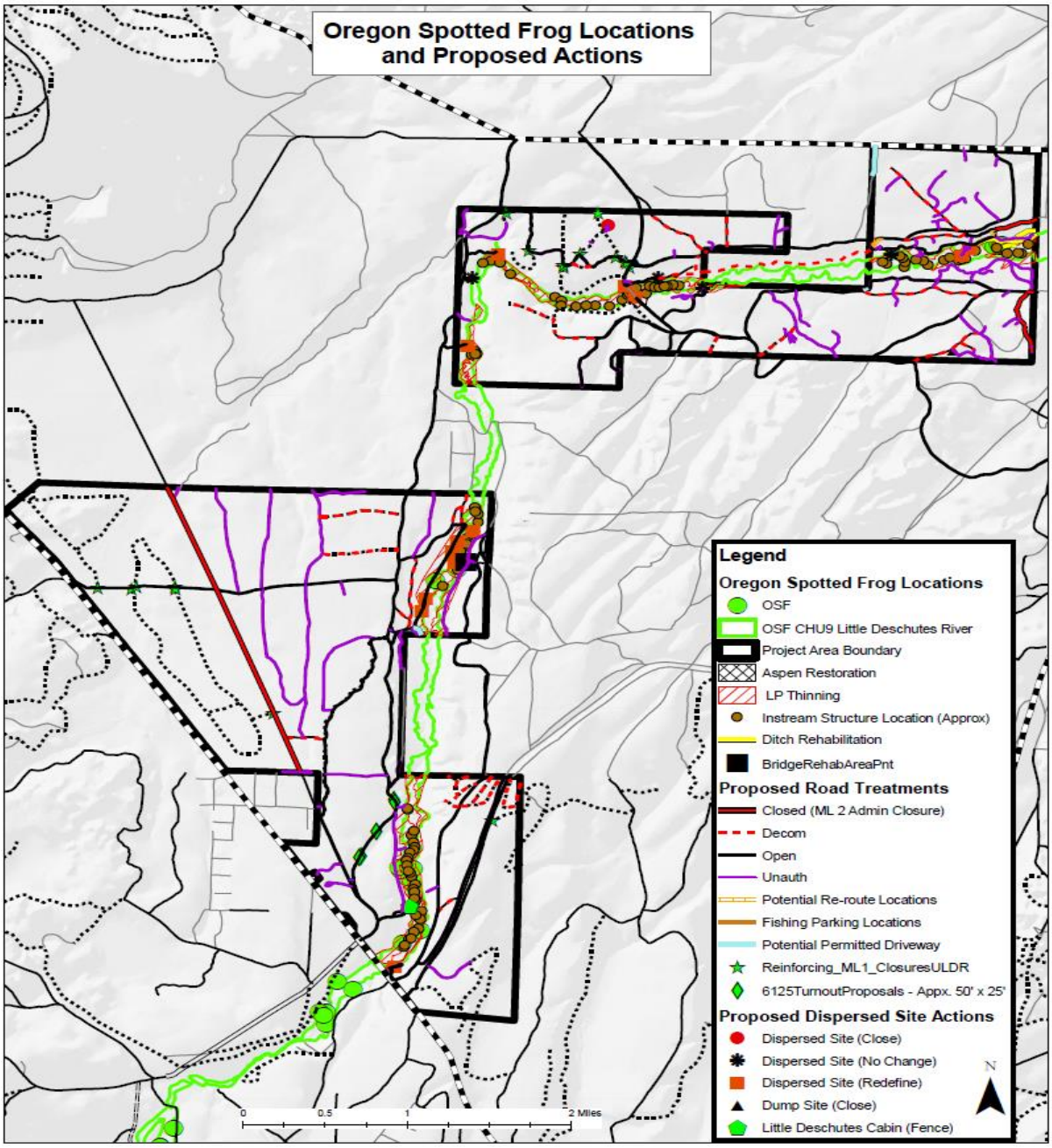

Figure 13. Oregon Spotted Frog Locations and Proposed Actions

Gray Wolf (*Canis lupis*)

Gray wolves were protected by the Endangered Species Act of 1973 when only a few hundred remained in extreme northeastern Minnesota and a small number on Isle Royale, Michigan (Wildlife Report at 20). They were listed as Endangered in the contiguous 48 states except in Minnesota, where they were listed as Threatened. Gray wolves were reintroduced into Yellowstone National Park and National Forest lands in central Idaho in 1995 and 1996. The reintroduction has been successful and recovery goals for this population have been exceeded with wolves now populating areas outside the reintroduction zone, including packs in eastern and southern Oregon. According to the ODFW website (http://www.dfw.state.or.us/wolves), as of March 27, 2019, there are no Areas of Known Wolf Activity (AKWAs) designated on the Deschutes National Forest.

Gray wolves form packs consisting of a breeding pair, their offspring, and other non-breeding adults. Packs defend territories ranging from 50 to 1,000 square miles depending on available prey, with deer and elk being important prey species. Lone, dispersing wolves often pair up with other unattached wolves to establish new packs and territories.

The Northern Rocky Mountain Wolf Recovery Plan (USFWS 1987) list three key components of wolf habitat as: "(1) a sufficient, year-round prey base of ungulates (big game) and alternate prey, (2) suitable and somewhat secluded denning and rendezvous sites, and (3) sufficient space with minimal exposure to humans."

Pre-field Review and Survey History

Several wolves have been known to travel through the Crescent Ranger District. In 2011, OR7 was the first documented wolf on the Deschutes National Forest. This wolf established the Rogue pack south of the forest boundary. Another wolf, a female OR3, traveled through and at one time was utilizing Walker Mountain, located on the southeast side of the Crescent District, as part of its use area. OR3 paired with OR28, and produced at least one pup in the summer of 2016. On October 6, 2016, OR28 was found dead near Summer Lake. They were using the Silver Lake Wildlife Management Unit in western Lake County and had been named the Silver Lake wolves. According to the ODFW website April 12, 2018 post, one large wolf has been documented in the area during the 2017 count. The status of the pup was not known. OR33, a male wolf, was also known to travel through the Crescent Ranger District. OR33's radio collar failed in August 2016. In October of 2017, OR33 was found dead on the Fremont-Winema National Forests. A new Area of Known Wolf Activity (AKWA) has been designated by ODFW in their March 21, 2019 update. The AKWA is located in the southern portion of the Indigo Unit in Douglas and Lane Counties, approximately one mile west of the Crescent Ranger District's western most border, and approximately 16 miles west of the project area. According to the ODFW website wolf activity has been reported by the public in this area for several years and biologists found tracks of multiple wolves. Currently there is little information about this new group.

Key habitat components within the project area are not favorable to wolves. The project area provides summer range for big game, but not winter range. While some deer and elk may winter on adjacent private land, most deer move east to winter range in October and November. Elk move out once snow levels reach depths that force them to relocate to wintering habitat to the east generally. Most of the project area is adjacent to private land that is currently broken up in multiple housing areas and private timberland. The project area and adjacent private and National Forest lands do not provide secluded denning and rendezvous sites or sufficient space with minimal exposure to humans. The area may be suitable for a portion of a home range, but not large or secluded enough for occupancy. The most likely use of the area would be summer foraging for dispersing wolves.

According to personal communications with ODFW and USFWS (August 2, 2018) there are continued sightings across the Crescent Ranger District, but currently no confirmed resident wolves on the Deschutes National Forest, or Crescent Ranger District.

Carnivore surveys were not conducted specifically for this project. Surveys were not needed to assess the potential effects of this project. Carnivore camera surveys have been conducted on the Crescent Ranger District in Ringo project area just to the north and west of the ULDR project area. Surveys in this area from 2014 through 2016 did not detect wolves. There are documented and undocumented sightings of individual wolves in the project area. Wolves continue to disperse through the Crescent Ranger District often using rivers corridors.

Direct, Indirect, Cumulative Effects and Determination
Alternative A - No Action
Wolves are closely associated with big game, their main prey animals. Big game use of the project area occurs year round in low snow years, and generally 6-8 months of spring through fall in normal to high snow years. Use areas by big game generally focus on secure blocks of habitat with little road access. With the current road density and configuration, there are only two blocks of habitat greater than 100 acres in the project area. Refer to the big game section for the Core Habitat Blocks analysis. There would be no alteration of use by big game with this alternative.

Public use of the project area occurs year round with snowmobiles in the winter and dispersed recreation throughout the summer. The bulk of the project area is bordered by private lands. There would be no change of use of the project area by the public. The level of current human use may discourage wolves from staying and establishing a territory.

Alternative B – Proposed Action
Stream restoration and lodgepole pine removal would increase foraging opportunities and fawning and calving areas for big game within restored wet and dry meadows along the river and has the potential to increase prey for wolves. Disturbance during restoration activities may cause big game to temporarily avoid the local areas. However, because the project is localized they would likely return in the evenings when activity stopped. Wolves following prey may also follow the same pattern if present during implementation.

Alteration of the current road system would increase the number of large blocks of land (greater than 100 acres) without road access and provide more security habitat for big game. Because wolves have a very large territory, the project area alone would not be able to sustain wolves without them utilizing adjacent private and National Forest Lands. While larger blocks of land without road access would benefit big game, it is unlikely to be a large enough area to benefit wolves.

Disturbance from implementation would temporarily change how big game use the project area pushing them away from riparian areas during the day. Changes to big game use patterns and disturbance from implementation would be local to specific areas at any given time and minor day to day. These minor changes in big game use patterns would not alter how gray wolf would utilize the project area since their use areas are so large.

Cumulative Effects Conclusion and Determination
With no overlapping projects that would impact wolves there are no cumulative effects.

Conclusion and Determination
There are no known confirmed resident wolves (USFWS August, 2018) within the project area. Current levels of human activity may already preclude wolves from staying in the area. During implementation, disturbance from equipment in and around the project area could move big game away from work locations. These effects to big game are localized and would not alter how the gray wolf utilize the project area. Implementation would result in a determination of **"No Effect"** to the gray wolf, as such, consultation with US Fish and Wildlife Service is not necessary.

Wolverine ***Federal Proposed Threatened, Regional Forester Sensitive, MIS***
August 12, 2014 the wolverine (*Gulo gulo*) was no longer a federal candidate for threatened species listing under the Endangered Species Act. The U.S. Fish and Wildlife Service (USFWS) stated, "*Using the best-available science, the U.S. Fish and Wildlife Service has determined the North American wolverine should not be listed as a threatened species under the Endangered Species Act*

(ESA)" (USFW 2014). In a published letter dated July 15, 2016, the USFWS proposed to list the North American wolverine as threatened under the Endangered Species Act (ESA). The USFWS stated the reason for proposed wolverine listing was because, "*The U.S. District Court for the District of Montana ordered the FWS on April 4, 2016, to reconsider whether to list the wolverine as a threatened species.*" The North American wolverine was listed on the Forest Service Region 6 Sensitive Species List (USDA 2011) and also designated as a Management Indicator Species for the Deschutes National Forest (USDA 1990). NatureServe (2017) gives them a state ranking of 'Critically Imperiled".

Wolverines occupy a wide variety of habitats from the arctic tundra to coniferous forest. The most common habitats are those that contain a high diversity of microhabitats and high prey populations. Copeland (2007) described wolverine habitat in the contiguous United States as consisting of small, isolated "islands" of high-elevation, alpine habitats containing sufficient snow depth during the denning period, separated from each other by low valleys of unsuitable habitats. Wolverines occupy habitat in a high elevation band from 6,888 feet to 8,528 feet in the mountains of the lower 48 states (Federal Register/ Vol. 73, No. 48/ Tuesday, March 11, 2008).

Pre-field Review and Survey History

There is no suitable denning habitat for wolverine in the project area. There are no confirmed records of sightings of wolverine in the project area. There is one unconfirmed observation in the southern portion near Highway 58. Because rural subdivisions surround or are on at least two sides of the project area, it is unlikely wolverine would utilize it. Long distance dispersal may be a potential use of the project area by wolverine. No surveys were conducted for this project. Surveys were not needed to assess the potential effects of this project.

Direct, Indirect, Cumulative Effects and Determination

There is no denning habitat within the project area for wolverine. Implementation of the project would not alter any potential use of the area by wolverine. There would be no direct, indirect, or cumulative effects on wolverine. The ULDR project would have "**No Effect**" on wolverine and would not contribute to any change in population trend in viability on the Deschutes National Forest.

Pacific Fisher *Federal Proposed Threatened, Regional Forester Sensitive*

The U.S. Fish and Wildlife Service (USFWS) was issued a court order in April 2003 to conduct a 90-day finding on a petition to list a distinct population segment of the fisher. In July 2003, the USFWS published a 90-day finding that substantiated a listing may be warranted and began a 12 month status review. In April 2004, the USFWS determined the fisher in Washington, Oregon, and California is a "distinct population segment" (DPS) of the entire fisher species (*Pekania pennanti*). The USFWS determined the fisher faces significant biological threats sufficient to warrant listing but is precluded by other higher priority listing actions (Federal Register Vol. 69, No. 68). On October 7, 2014, the USFWS changed the candidate status to propose threatened for the West Coast DPS of fisher (*Pekania pennant*; Fed. Reg. 2014c). At the time of the 2014 proposed listing, the USFWS found the designation of critical habitat for fisher to be "not determinable" (Fed. Reg. 2014c). On April 14, 2016 the USFWS issued its finding that the pacific fisher west coast distinct population segment does not require the protection (USFW 2018). The fisher remained on the R6 Sensitive list until September 2018 when a federal judge rescinded USFWS 2016 decision to deny the fisher protection status and ordered the agency to issue a new finding by March 22, 2019. NatureServe (2018) gives them a state ranking of "critically imperiled".

The fisher is a house-cat sized member of the Mustelidae family which includes weasels, mink, marten, and otters. Their occurrence is closely associated with low- to mid-elevation forests (generally less than 4,101 ft. [1,250 m]) with a coniferous component, large snags or decadent live

trees, and logs for denning and resting, and complex physical structure near the forest floor to support adequate prey populations (Powell and Zielinski 1994). Major prey species include small to medium sized mammals, bobcat, birds, and carrion. Porcupine are the best known prey species but fisher also prey on snowshoe hare, squirrels, mice and shrews (Powell and Zielinski 1994).

Fisher populations are considered to be extremely low in Oregon, Washington, and parts of the Rocky Mountains. Gibilisco (1994) described the presumed historical range of fishers including lands within the state of Oregon. The eastern extent included the eastern portion of the Cascade Range to Bend and southward to Paulina Peak, Walker Rim, and lands in the Fremont-Winema National Forests. In Oregon, the fisher has been extirpated from all but two portions of its historical range (Aubry and Lewis 2003); in the southwestern portion of the state, one in the southern Cascade Range was established through reintroductions of fishers from British Columbia and Minnesota that occurred between 1961 and 1981, and one in the northern Siskiyou Mountains of southwestern Oregon presumed to be an extension of the population in northern California.

Pre-field Review

There are no known population of Pacific fisher on the Deschutes National Forest. The closest population to the project area is approximately 50 miles to the southwest on the Rogue River-Siskiyou National Forest. The Fed. Reg. 2014c identifies this population as a reintroduced population, Southern Oregon Cascades (SOC) Reintroduced Population. There are no documented occurrences of fisher within the project area. However, there is one 1999 documented occurrence of a radio collared dispersing male fisher from this population within the Big Marsh area. The closest current detection was March 2014 in Paddy's Valley on the Willamette National Forest, approximately 14 miles away from the project border.

There is no potential denning habitat for the fisher within the project area. The most likely use of the project area by fisher would be dispersal.

Survey History

No surveys were conducted for this project. Surveys were not needed to assess the potential effects of this project.

Direct, Indirect, Cumulative Effects and Determination

There is no denning habitat within the project area for fisher. Implementation of the project would not alter any potential dispersal of fisher through the project area. There would be no direct, indirect or cumulative effects on fisher. The ULDR project would have **"No Effect"** on Pacific fisher.

Sensitive Wildlife Species

Within the analysis areas there is potential habitat for the following Region 6 Sensitive Species: northern bald eagle, bufflehead, white-headed woodpecker, northern waterthrush, Crater Lake tightcoil, shiny tightcoil, silver-bordered fritillary, and western bumblebee.

Northern Bald Eagle

The northern bald eagle was officially de-listed as a federal threatened species on August 8, 2007. The Federal Register (Vol. 72, No. 130/Monday July 30, 2007) stated the bald eagle has made a dramatic resurgence from the brink of extinction. While the bald eagle has been de-listed they are still protected under the Bald and Golden Eagle Protection Act of 1940. This law provides for the protection of bald and golden eagles by prohibiting the take, possession, sale, purchase, barter, offer to sell, transport, export or import, of any bald or golden eagle, dead or alive, including any part,

nest, or egg, unless allowed by permit (16 U.S.C. 668(a); 50 CFR 22). NatureServe (2017) lists the Oregon status as "apparently secure"[13].

The northern bald eagle was selected as a Management Indicator Species (MIS) for the Deschutes National Forest. Certain river or lake locations on the Forest are extremely important as feeding sites during the reproductive, fall and winter, periods. Most bald eagles are sensitive to human disturbance during these time periods. Over-mature ponderosa pine or mixed conifer forest is preferentially selected for nesting or winter-roosting habitat.

Pre-field Review and Survey History

There are currently 17 bald eagle nesting territories on the Crescent Ranger District. All known nests on National Forest lands on the Crescent Ranger District are associated with Odell Lake, Crescent Lake, Davis Lake, and Wickiup Reservoir. The nearest nest to the project area is located on private land approximately one to two miles away from the northern and southern section of the project area. It is suspected this pair utilizes Davis Lake and the Little Deschutes River for foraging including the large privately owned meadows near the junction of Highway 97 and Forest Service Road 61. There are not acres of nesting habitat but large trees scattered in the uplands that may provide potential nesting habitat within the project area. Eagle observations occur within the river corridor. Foraging and dispersal would be the most likely use of the project area by bald eagles.

Direct, Indirect, Cumulative Effects and Determination

Alternative A - No Action

There would be no change in habitat or use of the area for bald eagles. Large trees with views of the river exist in many of the dispersed sites. Activity levels could make these trees unsuitable for nesting.

Alternative B – Proposed Action

Riparian restoration efforts would remove trees to create stream structures. Because no trees over 21 inches dbh would be removed, there would be no removal of potential nest, roost, or perch trees. Instream projects, once completed, would improve water quality and habitat for fish, having the potential to increase the prey base for eagles utilizing this stream system.

Decommissioning of unauthorized roads and trails would reduce the number of motorized access points to the river, which may discourage some recreationists from using the area. There is no indication that there would be a change in current levels of recreation. With no overlapping projects that would impact eagles there would be no cumulative effects. Implementation of the ULDR project would have **"No Impact"** to the northern bald eagle with the potential for increased prey base. The project would not contribute to a negative trend in viability on the Deschutes National Forest.

Bufflehead

The bufflehead is North America's smallest diving duck. It winters throughout Oregon but is an uncommon breeder in the central and southern Cascades (Marshall 2003). Known nest sites in central and southern Oregon include Hosmer Lake, Crane Prairie Reservoir, Twin Lakes, Wickiup Reservoir, Davis Lake and along the Little Deschutes River in Deschutes County.

The bufflehead will use tree cavities or artificial nest boxes in trees close to water. Marshall (1996) stated that human disturbance from high recreation use at Cascade Lakes and a shortage of suitable nesting cavities due to forestry practices may be having an impact on their population status. The bufflehead was designated as MIS under the LRMP due to its popularity for hunting and viewing.

[13] See MIS Table 1 for definitions of NatureServe status

The Oregon breeding population is considered sensitive by the ODFW because of its small size and limited nesting habitat (Marshall et al. 2003). NatureServe (2017) lists the Oregon status as "imperiled breeding/secure non-breeding".

Pre-field Review and Survey History
There are no known sightings of buffleheads in the project area. Nesting habitat exists in small patches throughout the project area. No surveys were conducted for this project. Surveys were not needed to assess the potential effects of this project.

Direct, Indirect, Cumulative Effects and Determination
Alternative A - No Action
There would be no change to habitat elements for the bufflehead. Species react differently to recreation and current levels of activity near potential nesting habitat may preclude use by buffleheads.

Alternative B – Proposed Action
Improving water quality and diversity of wetland habitats along the Little Deschutes River could increase foraging habitat for the bufflehead. Although trees would be removed for stream structures and lodgepole pine removed from along the edges of the meadow, there would be no nest sized trees or snags removed. Implementation would take place in late summer or early fall, after nesting season.

Actions for sustainable transportation decreases OHV use along the river. These actions have the potential to decrease disturbance to potential nesting habitat. Reducing the size of a dispersed site and pulling sites away from the riparian area, would not be sufficient to increase use of these areas by buffleheads. There are no overlapping projects that would impact buffleheads so there would be no cumulative effects.

While there is the potential of increased foraging habitat and undisturbed nesting habitat it is unknown if there would be sufficient increase to be a benefit to the bufflehead. Implementation of the ULDR project would have **"No Impact"** to the bufflehead. The project would not contribute to a negative trend in viability on the Deschutes National Forest.

White-headed Woodpeckers,
White-headed woodpeckers are also considered a management indicator species (MIS) for the Deschutes National Forest as well as a migratory bird focal species. White-headed woodpeckers are uncommon permanent residents in forests east of the Cascades. They occur primarily in open forest with large ponderosa pine (dead and alive), low shrub levels, and large snags (Marshall et al. 2003). Old-growth stands have greater densities of the large-diameter snags that white-headed woodpeckers appear to select for nesting (Frenzel 2002). The woodpecker is also known for utilizing large stumps and smaller diameter snags (Frenzel 2002) when large-diameter snags are not available.

Pre-field Review and Survey History
There is approximately 325 acres of potential white-headed woodpecker nesting habitat within the ULDR project area. There is also foraging habitat available. There are no observations for white-headed woodpecker within the project area. There are unconfirmed observations outside of the project area. Surveys were not conducted for this analysis. Surveys were not needed to assess the potential effects of this project.

Direct, Indirect, Cumulative Effects and Determination
Alternative A - No Action

There would be continued change in white-headed woodpecker nesting habitat adjacent to roads. While unauthorized roads traverse through nesting habitat for the white-headed woodpecker, woodpeckers are not usually disturbed by motorized use. Existing roadside firewood currently overlap approximately 51 acres reducing snags under 21 inches dbh. Disturbance from woodcutting and reduction of this secondary nesting structure along open roads would continue with this alternative.

Alternative B – Proposed Action

Habitat for the white-headed woodpecker is in the uplands away from the riparian restoration actions. There are no dispersed recreation sites within nesting habitat. Closing roads closes approximately 15 acres within potential nesting habitat to future firewood cutting. Opening roads opens approximately 26 acres for firewood cutting not previously opened. While snags under 21 inches dbh that may provide secondary nesting structures for the white-headed woodpecker have already been removed on 15 acres of roadside firewood, this acreage would not be available in the future. The 26 acres opened for firewood cutting would reduce nesting structures. People running chainsaws would cause disturbance to white-headed woodpeckers during the firewood cutting period.

Cumulatively there would be disturbance and reduction of secondary nesting structure in 62 acres of white-headed woodpecker nesting habitat along open roads. Reduction of nesting structures as well as disturbance by firewood cutting on 62 acres of white-headed woodpecker nesting habitat **"May impact individuals or habitat, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species."** The ULDR project would contribute to a slight negative trend in viability of white-headed woodpeckers on the Deschutes National Forest.

Northern Waterthrush,

The northern waterthrush is a small neotropical migrant that travels long distances nocturnally. Breeding habitat in North America includes a small area in the central Cascades of Oregon. NatureServe (2017) ranks the species in Oregon as "imperiled-breeding." The birds in central Oregon seem to prefer dense riparian willow thickets along water and are usually found in willow clumps five to eight feet high, with some Sitka alder intermixed with small grassy patches and pools of water left in old stream meanders. No nests have been found (Contreras 1988).

Pre-field Review and Survey History

Surveys indicate the species is present along the Little Deschutes River and Crescent Creek on the Crescent Ranger District (Boucher pers comm. 2008 and Rosterolla pers comm. 2012). District surveys have also found northern waterthrush in small, open lodgepole pine pockets occurring adjacent to slow moving water with a dense willow component. Northern waterthrush habitat is present within riparian areas along the Little Deschutes River where willows are present. Known northern waterthrush locations are in Sections 29 and 33 within the project boundary. In 2011 surveys on all likely habitat on the District were conducted. Surveys confirmed northern waterthrush in Sections 29 and 33.

Direct, Indirect, Cumulative Effects and Determination

Alternative A - No Action

Dispersed Sites (DS) #5 and #6 are in the vicinity of the Section 33 location and DS #18 is located within Section 29 occupied northern waterthrush habitat. Continued expansion of these sites may remove existing waterthrush habitat.

Alternative B – Proposed Action

Riparian restoration would restore water connections to the flood plain increasing willows and potential nesting habitat throughout the project area. Removal of dense lodgepole pine would reduce

this secondary nesting habitat in the short-term, but increase preferred willow habitat in the long-term. Defining existing riverside dispersed sites and reducing unauthorized roads along the river would decrease destruction and disturbance of occupied habitat and potential habitat. No other sustainable transportation actions would impact the northern waterthrush. Implementation of the project would occur after the breeding season.

With no overlapping projects that would impact the northern waterthrush there would be no cumulative effects. With an overall increase of habitat from riparian restoration actions and a decrease in loss and disturbance of occupied and potential habitat, the ULDR project has the potential to increase the population of northern waterthrush on the Little Deschutes River. Implementation of the ULDR project would have a **"Beneficial Impact"** to the northern waterthrush.

Bats

Most bats are insectivores and need insects to eat, water to drink and places to roost and hibernate. R6 Sensitive bat species include the Townsend's bit-eared bat, pallid bat, spotted bat and the fringed myotis.

Townsend's Big-Eared Bats is a non-migratory bat that is highly dependent on caves, or cave-like structures including mines, for winter hibernation (October-May), maternity colonies for birthing and rearing young, and day and night roost sites. Winter hibernation sites that provide cold winter temperatures and maternity sites that provide high temperatures free from human disturbance are critical habitat components needed by this species and are limited on the Forest. This species also uses buildings, bridges, and rock crevices for roost sites in open montane, ponderosa pine, and juniper forests. Townsend's big-eared bats feed primarily on moth species. Individuals moved up to 15 miles (24 km) from hibernacula to foraging areas (NatureServe 2018). Both sexes apparently used a series of interim roost sites between emergence from hibernation and the time females entered maternity colonies, with little individual fidelity to these sites. The Townsend's big-ear bat was selected as a Management Indicator Species (MIS) for the Deschutes National Forest. It is an indicator species for cave habitats.

Pallid bats are found in arid deserts and grasslands, often near rocky outcrops, water, and less abundant in evergreen and mixed conifer woodlands. Pallid bats usually roost in rock crevices or buildings, and less often in caves, tree hollows, mines, etc. (Harvey et al. 1999). In Oregon, night roosts were in buildings, under rock overhangs, and under bridges; bats generally were faithful to particular night roosts both within and between years (Lewis 1994). Pallid bats prefer narrow crevices in caves as hibernation sites (Caire et al. 1989). Foraging areas generally are not far from day roosts but up to at least 4-7 miles (7-11 kilometers) away (NatureServe 2018).

Spotted Bats occurs in various habitats from desert to montane coniferous stands, including open ponderosa pine, pinyon-juniper woodland, canyon bottoms, riparian and river corridors, and meadows. NatureServe (2018) reported this species roosts in caves, cracks and crevices in cliffs and canyons. Habitat requirements, presence of large cliffs and water, appear to limit its distribution (Rodhouse et al. 2005). Moths appear to be the primary food source. Active foraging may be mostly in open terrain, including forest clearings, meadows, and open wetlands (NatureServe 2018).

Fringed Myotis are migratory to Oregon. They occur primarily at middle elevations in desert, riparian, grassland, and woodland habitats. On the east side of the Cascade Range in Oregon and Washington, females roosts primarily in rock crevices and infrequently in ponderosa pine snags. Their primary food source appears to be moths, beetles, and spiders that they capture in flight or glean from plants (NatureServe 2018). Foraging occurs close to the vegetative canopy (NatureServe 2018).

Pre-field Review and Survey History.
There are no known caves or mines on the Crescent Ranger District (L. Hickerson pers comm. 2008) to provide habitat for the Townsend's, pallid or spotted bat, or the fringed myotis. The nearest caves on the adjacent district is approximately 25 miles northeast of the project area. The nearest cave known to be occupied by bats is approximately 45 miles northeast of the project area. At the boundary of the project area there is a bridge that crosses the Little Deschutes River on Highway 58 that may provide roosting habitat for Townsend's and pallid bats and fringed myotis. Large diameter hollow trees that may provide roosting habitat for fringed myotis and pallid bats do not exist in the project area but may occur outside the project area. NatureServe (2018) ranks all of these bats as "imperiled".

The Townsend's, spotted bats, and fringed myotis occur in caves on the Bend-Ft. Rock Ranger District of the Deschutes National Forest. Pallid bats are suspected to occur on the Deschutes National Forest as yet there have been no detections. No observations or detections of any of these bats have been reported on the Crescent Ranger District. No surveys were conducted specifically for this project. Surveys were not needed to assess the potential effects of this project on R6 sensitive bats.

Direct, Indirect, Cumulative Effects and Determination
Alternative A - No Action
R6 sensitive bats are unlikely to be present in the project area but have potential foraging habitat within the project area over water, within riparian areas, meadows, and forest openings. The No Action Alternative would not alter how these bats would utilize the project area.

Alternative B – Proposed Action
There are no proposed actions that would alter habitat for bats. There is no maternity, roosting, or foraging habitat that would be altered or disturbed by any proposed actions. All actions take place during the day so there would be no disruptions to foraging bats. Implementation of the ULDR project would have **"No Impact"** to the Townsend's big-eared bat, the spotted bat, the pallid bat, or the fringed myotis. The project would not contribute to any change in population trend of the Townsend's big-eared bat's viability on the Deschutes National Forest.

Tightcoils
The **Crater Lake tightcoil** may be found in perennially wet situations in mature conifer forests, among rushes, mosses and other surface vegetation or under rocks and woody debris within 33 ft. (10 m) of open water in wetlands, springs, seeps, and riparian areas, generally in areas which remain under snow for long periods of time during the winter. Riparian habitats in the eastern Oregon Cascades may be limited to the extent of permanent surface moisture, which is often less than 33 ft. (10 meters) from open water (Duncan et al. 2003). NatureServe (2017) lists the Oregon status of the Crater Lake tightcoil as "critically imperiled."

Most known sites for the **shiny tightcoil** are in ponderosa pine and Douglas-fir forests at moderate to high elevations (Frest and Johannes 1995 in USDA 2010). The eastern Washington record is from a relatively moist, shaded basalt cliff with talus and deciduous (aspen, cottonwood) cover. Elsewhere the habitat is described as primarily under deciduous trees, particularly quaking aspen and red alders (Burke and Leonard in USDA 2010).

Pre-field Review and Survey Methods and Results
There is only one confirmed occurrence of the Crater Lake tightcoil on the Crescent Ranger District, found at the confluence of Princess Creek and Odell Lake in 1999. There is potential habitat along the Little Deschutes River where tree cover prevents habitat from drying out.

There are no known sites for the shiny tightcoil on the Crescent Ranger District. Potential habitat may occur under hardwoods such as willows and aspen where they occur in seasonally or perennially wet areas. There is potential habitat along the Little Deschutes River. Surveys were not conducted for this analysis. Surveys were not needed to assess the potential effects of this project.

Direct, Indirect, Cumulative Effects and Determination
Alternative A - No Action
There would be little change to tightcoil habitat with this alternative. There is potential for recreational dispersed sites to continue to spread into perennial wet areas removing vegetation and decreasing habitat. Unauthorized roads would continue to provide motorized access into sensitive wet areas, preventing natural restoration of habitat for tightcoils.

Alternative B – Proposed Action
Stream structures would increase connections to the flood plain and recharging ground water has the potential to increase habitat for both of the tightcoils by increasing seasonal and perennial wet areas. Restoration of willows and aspen stands would also benefit the shiny tightcoil providing additional hardwood habitat.

All recreational dispersed sites and unauthorized trails are adjacent to the river or perennial wet areas. Dispersed sites are to be pulled back from the riparian area. Because of the moisture available, native plants are expected to be reestablished in these areas providing habitat for Crater Lake tightcoil. Where shrubs and willow or other hardwoods become established, habitat for the shiny tightcoil would be reestablished.

The unauthorized road leading from DS #1 to #2 would be blocked and the foot print would be reduced to a trail. Once the unauthorized bridge is removed, the unauthorized OHV trail and bridge area near DS #14 would be rehabilitated and provide additional habitat. Other unauthorized roads would be closed and rehabilitated where necessary, reducing motorized access to sensitive wet areas. No other sustainable transportation actions are within tightcoil habitat.

With no overlapping projects that would impact tightcoil habitat there would be no cumulative effects. With an overall increase of habitat from riparian restoration actions and a decrease in loss and disturbance of potential habitat the ULDR project has the potential to increase the quantity and quality of habitat for both the Crater Lake tightcoil and the shiny tightcoil. Implementation of the ULDR project would have a **"Beneficial Impact"** to the Crater Lake tightcoil and the shiny tightcoil.

Butterflies
Pre-field Review and Survey History
The **Silver-bordered fritillary** is common and widespread in northeastern Washington and northern Idaho. Colonies are extremely local and isolated southward, and are particularly vulnerable to local extinctions. Only two primary colonies are found in Oregon, one at Big Summit Prairie on the Ochoco National Forest and one in the Strawberry Mountains Wilderness on the Malheur National Forest (Miller and Hammond 2007). This species is dependent on the maintenance of open and wet meadow habitats (Miller and Hammond 2007).

NatureServe (2018) lists the Oregon state ranking as "Imperiled". While there is potential habitat on the Crescent Ranger District, there are no known occurrences of the silver-bordered fritillary. Surveys for the silver-bordered fritillary have occurred opportunistically along the meadow and wetland areas in 2015 and 2016 - none were observed.

Direct, Indirect, Cumulative Effects and Determination
Alternative A - No Action
While meadow and floral habitat occurs within the project area, it is unknown if it is suitable for either butterfly. There would be no change to butterfly habitat with this alternative. There is potential for recreational dispersed sites to continue to spread, removing vegetation and decreasing habitat diversity of vegetation at those sites. Encroaching lodgepole pine would continue to reduce riparian habitat and the flowering species that occur there.

Alternative B – Proposed Action
Removal of lodgepole and construction of instream structures increasing connections to the floodplains would provide additional wet meadow habitat increasing the diversity of flowering plants for the butterflies. Lodgepole pine cutting may remove some trees with mistletoe but the older larger trees, most likely to be infected, would remain.

All recreational disperse sites and unauthorized trails adjacent to the river or perennial wet areas are to be pulled back from the riparian areas and roads that go through meadow areas would be closed. Because of the moisture available, native plants are expected to re-establish quickly in these areas. Re-establishment of native plants may increase foraging habitat for the adult form of both of the butterflies.

With no overlapping projects that would impact butterfly habitat, there would be no cumulative effects. With an overall increase of diversity of flowering plants in meadow habitats from restoration actions and a decrease in the loss and disturbance of potential habitat from the recreating public, the ULDR project may have a **"Beneficial Impact"** to the silver-bordered fritillary.

Western Bumblebee
Western bumblebee was once widespread and common throughout the western United States and western Canada before 1998. For Oregon, NatureServe (2018) lists them as "critically imperiled" to "imperiled." The western bumblebee visits a wide variety of wildflowers including Aster spp., *Gaultheria shallon* (salal), *Pedicularis* (elephant's head), *Penstemon, Phacelia, Prunus* spp. (cherry), *Rhododendron* spp., *Solidago* spp. (Goldenrod), *Symphoricarpos* spp. (snowberry), *Trifolium* spp. (clovers), *Salix* (willow), plus many others. The western bumblebee nests underground, often utilizing abandoned rodent burrows and bird nests. Hibernation sites include dead grass, and leaf litter under shrubs and trees (Xerces 2015).

Morrisoni Bumblebee (*Bombus morrisoni*) –NatureServe (2019) lists them as "critically imperiled" to "imperiled" in Oregon. The Morrisoni bumblebee is thought to be a moderately widespread species. A generalist forager the Morrisoni bumblebee has a very short tongue and is best suited to forage at open flowers with short corollas (Williams et al. 2014). According to Williams et al. (2014), important food plants for *B. morrisoni* are in the genera *Asclepias, Astragalus, Chrysothamnus, Cirsium, Cleome, Ericameria, Helianthus, Melilotus,* and Senecio. Similar to the western bumblebee the Morrisoni is also thought to nest underground.

Suckley Cuckoo Bumblebee *(Bombus suckleyi)* – Is not currently ranked in NatureServe (2017) for Oregon, but globally "impaired". A species in the subgenus *Psithyrus* they are unique in that they are dependent on another *Bombus* spp. to serve as a host. As with other cuckoo species they are nest parasites of other bumble bees. They emerge in the spring later than their hosts. Once they find a suitable host the female *Psithyrus* takes over the colony. *B. suckleyi* has been documented breeding as a parasite of colonies of *Bombus occidentalis,* and has been recorded as present in the colonies of *B. terricola, B. rufocinctus, B. fervidus, B. nevadensis, and B. appositus* (Williams et al. 2014).

Pre-field Review and Survey History

Western bumblebees have been documented on the Deschutes National Forest near Sparks Lake, in the Sunriver vicinity, and along the Little Deschutes River and Crescent Creek on the Crescent Ranger District. In Oregon, this **Morrisoni bumblebee** has been "Documented" on the Wallowa-Whitman and Willamette National Forests. It is "Suspected" on the Umatilla, Ochoco, Malheur, Deschutes, and Fremont-Winema National Forests and on the BLM Burns District lands due to proximity to known records. **Suckley cuckoo bumblebee** has been historically observed along the Cascade Mountains, with a few observations in the coast range, and a handful of observations in the northeastern portion of the state (Richardson 2017). The two most recent records from the state are from 1994 in Lane County (Richardson 2017) and 2015 in Jackson County (Xerces Society et al. 2017). In Oregon, this species has been "Documented" on the Deschutes, Fremont-Winema, Mt. Hood, Rogue River-Siskiyou, Wallowa-Whitman and Willamette National Forests, as well as the BLM Northwest Oregon District lands. Surveys have occurred opportunistically along the meadow and wetland areas in 2015 and 2016 resulting in location of a western bumblebee. Data located in NRIS database. No other sensitive bumblebees were found.

Direct, Indirect, Cumulative Effects and Determination

Alternative A-No Action

There would be no change to bumblebee habitat with this alternative. There is potential for recreational dispersed sites to continue to spread, removing vegetation, thus decreasing habitat. Unauthorized roads would continue to provide motorized access, preventing restoration of potential habitat for bumblebees.

Alternative B – Proposed Action

Lodgepole pine removal and stream structures increasing connections to the flood plain and recharging ground water would providing a greater gradient of wet to dry conditions increasing the diversity of flowering plants for bumblebees. Holding water later into the summer also has the potential for lengthening the flower period, which would also benefit bumblebees.

All recreational dispersed sites and unauthorized trails that are adjacent to the river or perennial wet areas are to be pulled back from the riparian area. Unauthorized roads would be closed and rehabilitated where necessary, reducing motorized access to sensitive areas where bumblebees forage. Because of the moisture available, native plants are expected to be reestablished in these areas.

With no overlapping projects that would impact bumblebee habitat there would be no cumulative effects. With an overall increase of habitat from riparian restoration actions and a decrease in the loss and disturbance of potential habitat the ULDR project would have a **"Beneficial Impact"** to the western bumblebee, Morrisoni bumblebee and Suckley cuckoo bumblebee.

MANAGEMENT INDICATOR SPECIES (MIS)

During the preparation of the Deschutes National Forest Land and Resource Management Plan (LRMP; USDA 1990), a group of wildlife species were identified as Management Indicator Species (MIS). These species were selected because their welfare could be used as an indicator of other species dependent upon similar habitat conditions. Indicator species can be used to assess the impacts of management actions on a wide range of other wildlife with similar habitat requirements.

The following tables displays the Management Indicator Species (MIS) selected for the Deschutes National Forest. It includes the species NatureServe Status, a brief habitat description, what the species is an indicator for and species presence and/or habitat within the project area. NatureServe

Status is a risk of extirpation rating. NatureServe and its network of natural heritage programs, including the Oregon State Heritage Program, are the leading source of information about rare and endangered species and threatened ecosystems. The ratings are alpha numerical with the following definitions:

S=Subnational geographic scale in this case it is the state of Oregon, National and/or Global rankings may differ.
1 = Critically Imperiled—At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.
2 = Imperiled—At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
3 = Vulnerable—At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
4 = Apparently Secure—At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
B = Breeding—Conservation status refers to the breeding population of the species in the nation or state/province.
N = Nonbreeding—Conservation status refers to the non-breeding population of the species in the nation or state/province.
M = Migrant—Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the nation or state/province.
SHB = possibly extirpated breeding.

More information on NatureServe can be found at their website: http://explorer.natureserve.org/index.htm. Habitat descriptions are a synopsis of and incorporated by reference of the Forest-wide assessment for MIS identified in the Deschutes LRMP (1990) completed for the entire Deschutes National Forest (USDA 2012). A complete description of habitat needs can be found in those analyses.

MIS TES
Please refer to the TES section for analysis of these species.

Table 9. Species that are TES Species that are also Designated MIS

Species	Nature Serve Status	General Habitat	Indicator For	Species or Habitat Present
TES SPECIES				
Northern spotted owl (see TES)	S3	Old growth mixed conifer forest	Dense, mature old growth mixed conifer forest	No
Wolverine (See TES)	S1	Mixed forests, High elevations	TES	No
American peregrine falcon (See TES)	S1	Cliffs and Riparian	TES	No
Townsend's big-eared bat (See TES)	S2	Roost sites in building, caves and bridges	TES	No
Lewis's woodpecker (See TES)	S2	Open Ponderosa Pine habitat, cottonwood dominated riparian habitat	Snags	No
Northern bald eagle (See TES)	S4	Lakeside with large trees	Large trees	Yes

Species	Nature Serve Status	General Habitat	Indicator For	Species or Habitat Present
Bufflehead (See TES)	S2B,S5 N	Utilizes tree cavities in dense forest close to lakes and ponds and low gradient rivers	Popular for hunting or viewing	Yes
White-headed woodpecker (See TES)	S2	Old growth Ponderosa Pine open with low brush densities	Snags	Yes

BIRDS OF PREY

Includes northern goshawk, Cooper's hawk, sharp-shinned hawk, red-tailed hawk, great gray owl, osprey and golden eagle. All but the golden eagle have potential nesting and/or foraging habitat within the project area.

Table 10. Birds of Prey that were Designated MIS in the LRMP

Species	Nature Serve Status	General Habitat in Oregon	Indicator For	Species or Habitat Present
Birds of Prey				
Northern goshawk	S3	Closed (nesting and foraging) to open (foraging) canopy forests with a mosaic of large trees, snags and down wood suitable for foraging, nesting and post-fledgling areas.	Dense Mature and Old Growth ponderosa pine, also lodgepole pine, Mixed-Conifer Forests (Biological Community Barometer Species)	Yes, approx. 537 acres of potential nesting habitat, no known nests
Cooper's hawk	S4	Dense middle-aged mixed conifer forest (nesting) with open understory, open woodlands and riparian woodlands (foraging).	Dense Forest Species	Yes, approx. 245 acres of potential nesting habitat, no known nests
Sharp-shinned hawk	S4	Dense young mixed conifer forest (nesting and foraging)	Dense Forest Species	Yes, approx. 309 acres of potential nesting habitat, one known nest in northern portion of project
Red-tailed hawk	S5	Large trees in open canopy or edged habitat in conifer stands (nesting and foraging)	Non-Game Species of Special Interest	Yes, approx. 120 acres of potential nesting habitat, no known nests
Great gray owl	S3	Dense second growth to old growth coniferous and mixed conifer/lodgepole pine and or spruce forests (nesting) within proximity to openings in forests, meadows and/or wetlands (foraging)	Edge Species	Yes, approx. 1,938 acres of potential nesting habitat, no known nests
Osprey	S4	Nests within 2 miles of fish bearing bodies of water	Non-Game Species of Special Interest	Yes, approx. 5,067 acres of potential nesting habitat, no known nests
Golden eagle	S3S4	Elevated nest sites in open country	Non-Game Species of Special Interest	No habitat*

Species	Nature Serve Status	General Habitat in Oregon	Indicator For	Species or Habitat Present
*There is one unconfirmed sighting of golden eagle just outside the project area. Potentially misidentified juvenile bald eagle or a dispersing golden eagle. Golden eagles prefer larger areas of open country than exist on the Crescent Ranger District.				

Direct, Indirect, and Cumulative Effects

Alternative A - No Action

Previous vegetation management resulted in a mix of dense habitat that provides potential nesting for Goshawk, Cooper's hawk, sharp-shinned hawk, great gray owl; and foraging for sharp-shinned hawk; and varying degrees of canopy closure in open habitat that provides ecotones or edges for nesting red-tailed hawk, and osprey and foraging habitat for red-tailed hawk, great gray owl and Cooper's hawk. Potential nesting habitat for the birds of prey would be maintained in existing pockets and patches across the project area. Encroaching lodgepole pine on riparian meadows would continue to reduce foraging habitat for great gray owls and red-tailed hawks. Current road system and unauthorized roads break up habitat reducing core habitat blocks preferred for nesting and provides an avenue for disturbance to goshawk, Cooper's hawk, sharp-shinned hawk, great gray owl. Birds of prey vary in their response to recreational activities. Individual hawk responses to hikers, snowmobiles, motorcycles or horseback riders vary from habituation and tolerance to disruption of nesting.

Alternative B – Proposed Action

There would be no reduction in potential nesting habitat for any of the birds of prey. Although restoration efforts would remove trees to create stream structures, no trees over 21 inches dbh would be removed. There would be no removal of potential perch trees for birds of prey. Removal of encroaching lodgepole pine in stringer meadows and aspen would increase hunting opportunity and diversity of prey species for all the birds of prey except osprey. Instream projects, once completed, would improve water quality and habitat for fish, having the potential to increase the prey base for osprey foraging in this stream system.

Reduction of dispersed sites sizes, along with removal of unauthorized roads and trails has the potential to reduce recreational use in some areas of the river. Reduction of road densities in the uplands would reduce access to nesting habitat, creating larger blocks without potential disturbance. Other transportation actions of opening, permitting driveways, constructing pullouts, installation of signs etc., would have no impact to birds of prey or their habitat.

Overlapping projects that may have impacts to MIS birds of prey would be the roadside firewood project. There is one known nests for these species within the project area. The sharp-shin hawk nest in the northern portion of the project area. The nest is more than 0.25 miles from any proposed action on a closed road that would remain closed so there would not be any disturbance with either project. There would be no cumulative effects.

Conclusion

Implementation of the ULDR project would not alter nesting habitat for the MIS birds of prey. Reducing road density and number of dispersed sites would reduce potential disturbance to nesting habitat. Removal of lodgepole from stinger meadows and aspen may improve foraging for birds of prey that hunt in open conditions or edges such as great gray owls, red-tail hawks, and Cooper's hawk. Overall the ULDR project would not contribute to a negative trend in viability on the Deschutes National Forest for the northern goshawk, Cooper's hawk, sharp-shinned hawk, red-tailed hawk, great gray owl, or osprey.

DEADWOOD DEPENDENT SPECIES

Table 11 refers to the dead wood dependent species that were designated MIS in the LRMP. It includes the red-naped sapsucker, red-breasted sapsucker, Williamson's sapsucker, northern flicker, pileated woodpecker, black-backed woodpecker, three-toed woodpecker, hairy woodpecker, downy woodpecker, and Pacific marten. All but the pileated woodpecker have potential nesting and foraging habitat within the project area. There are no known nests or dens within the project area.

Table 11. MIS Wildlife Species – Deadwood Dependent Species

Species	Nature Serve Status	General Habitat	Indicator For	Species or Habitat Present
Dead Wood Dependent				
Red-naped sapsucker	S4B,S3N	Open pine, mixed conifer, and aspen forests, nests in snags greater than 10" dbh	Snags	Yes, habitat not modeled
Red-breasted sapsucker	S4	Aspen or willows within ponderosa pine forests	Snags	Yes, habitat not modeled
Williamson's sapsucker	S4B,S3N	Mid- to high-elevation mature or old-growth conifer forests with fairly open canopy cover	Snags	Yes, approx. 565 acres of potential nesting habitat
Northern flicker	S5	Open forests and forests edges adjacent to open country	Snags	Yes, approx. 1,460 acres of potential habitat
Pileated woodpecker	S4	Mature and old growth mixed conifer forest with abundant dead wood	Snags and down wood	No
Black-backed woodpecker	S3	Conifer forests including ponderosa pine, lodgepole pine, Douglas-fir/mixed conifer with high proportions of dead trees	Snags	Yes, approx. 2,313 acres of potential nesting habitat
Three-toed woodpecker	S3	Lodgepole pine, mixed-conifer, Douglas-fir/mixed conifer forests at high elevations	Mature and old growth lodgepole pine forest, also with Engelmann Spruce or Mtn. Hemlock (Biological Community Barometer Species)	Yes, approx. 2,022 acres of potential nesting habitat
Hairy woodpecker	S4	Mixed-conifer and ponderosa pine forests adjacent to deciduous stands	Snags	Yes, approx. 2,684 acres of potential nesting habitat
Downy woodpecker	S4	Aspen stands with riparian habitat, less common in mixed conifer and ponderosa pine forests	Snags	Yes, approx. 1,216 acres of potential nesting habitat

Species	Nature Serve Status	General Habitat	Indicator For	Species or Habitat Present
Pacific Marten	S3S4	Mixed conifer, lodgepole pine and high elevation hemlock/lodgepole pine late-successional forests	Dense, multi-layered, mature, and old growth forest, also lodgepole pine and Mtn. Hemlock Forests (Biological Community Barometer Species)	Yes, approx. 2,378 acres of potential denning habitat

Direct, Indirect, and Cumulative Effects

Alternative A - No Action

There is habitat scattered across the project area for these species. Recreational activity generally does not impact these species except where destruction of habitat occurs such as: at and in proximity to dispersed sites. Snags and down wood is generally cut for firewood at and within 100 to 200 feet of these sites depending on site size (some sites are larger than 100 feet). Extended presence of humans may also discourage utilization of the immediate area (approximately 300 feet) by marten. Current dispersed sites (including dump sites) with a 300' habitat alteration/disturbance zone buffer is approximately 142 acres which includes 28 acres of potential marten denning habitat and anywhere from 6-28 acres of woodpecker nesting habitat (Table 12). Marten, black-backed woodpecker, three-toed woodpecker, and hairy woodpecker have one acre or less of potential habitat at a large number of dispersed sites. Downy woodpecker, northern flicker, and Williamson sapsucker have more acres (5-10) at fewer sites. Red-breasted and red-naped sapsuckers' habitat was not modeled but is similar to downy and hairy woodpecker habitat respectively.

Table 12. Potential Nesting/Denning Habitat for Deadwood Species

Potential Nesting/Denning Habitat for Deadwood MIS	Forest Acres	Project Area Acres	Acres within Buffer of Rec. site	# Rec Sites with Habitat**
Black-backed woodpecker	647,390	2,313	19	All
Downy woodpecker (Red-breasted Sapsucker)*	178,054	1,216	20	5
Hairy woodpecker (Red-naped Sapsucker)*	722,366	2,684	21	16
Pacific Marten	474,478	2,379	28	19
Northern flicker	269,917	1,460	11	7
Three-toed woodpecker	540,207	2,022	18	All
Williamson sapsucker	26,710	565	6	2

*Red-naped and red-breasted sapsucker habitats are not mapped, but similar to hairy and downy and hairy woodpecker's habitat.
**Dump sites are include with dispersed recreation sites for a total of 21 sites.

In addition to recreation, on-going impacts to these species includes the roadside firewood project. This project provides the public opportunity to gather deadwood within 200 feet of an open road for firewood. Dead wood can be standing or down but limited to less than 21 inches dbh. There is approximately 1,100 acres of roadside firewood within the project area. Along with disturbance, habitat components are removed. The narrow strip impacted is negligible compared to available habitat across the Forest.

Alternative B - Proposed Action

Instream structure placement would not impact the upland habitats of this group of species. Removing lodgepole pine from streamside meadows and aspen stands would improve habitat for the red-naped sapsucker, red-breasted sapsucker, hairy woodpecker, downy woodpecker, and Williamson's sapsucker but remove potential nesting habitat for black-backed and three-toed woodpeckers.

Implementing the sustainable road system actions rearranges opened and closed roads, creating larger blocks of habitat that are not influenced by roads. However it also alters existing roadside firewood cutting areas. Unauthorized roads and closed roads with unauthorized use also had unauthorized firewood cutting, but cannot be quantified. While acknowledged it existed, they are not included in acres of roadside firewood. Those roads with authorized woodcutting increases with the implementation of the proposed project. The opening of previously closed roads in the north section of the project to make a through route would allow a new area for firewood gathering, as well as opening roads for access to private lands, and access for emergency vehicles in both sections.

With the implementation of the sustainable roads system actions, authorized and unauthorized routes would be closed, and existing closed roads would have closures reinforced. This would limit the unauthorized activities on those. Making through routes, safety routes, and access to private lands through opening roads would increase authorized woodcutting on 1,270 acres, an 170 acre increase overall. Table 13 shows the changes in habitat affected by the road changes and subsequent changes in firewood cutting areas. While there are acres that are dropped from firewood cutting, there are new areas added. There is more habitat impacted for all species except for the Williamson's sapsucker where change is minimal. Williamson's sapsucker would go from 125 acres of potential nesting habitat impacted to 122. While only a three acre difference, there are 33 acres dropped and 30 new acres added. The net change in total acres would be greatest for the northern flicker. There are 250 acres currently within firewood cutting areas. Changes in open roads results in 35 acres dropped and 154 acres of potential nesting habitat added, resulting in a 119 acres increase. The number of new acres added to firewood cutting areas is greatest for the hairy woodpecker (213 acres) and marten (216 acres). The total change in acres is small, 68 for the hairy woodpecker and 39 for the marten, however the number of acres of potential nesting and denning habitat dropped would be 145 and 177 acres respectively (see Table 13 below).

Firewood gathering would reduce nesting/denning and foraging components for all deadwood dependent species, reducing the quality and quantity of habitat within the 200 foot buffer along each side of open roads as defined on the MVUM map.

Table 13. Changes in Roadside Firewood with the Proposed Action

Potential Nesting/Denning Habitat for Deadwood MIS					
Species	**Acres of Habitat within Existing Roadside Firewood**	**Acres of Habitat within changed Roadside Firewood**	**Acres Dropped**	**New Acres**	**Net Change Acres**
Black-backed Woodpecker	466	492	104	130	26
Downy Woodpecker	199	311	30	142	112
Hairy Woodpecker	512	580	145	213	68
Pacific Marten	448	487	177	216	39
Northern Flicker	250	369	35	154	119
Three-toed Woodpecker	393	404	94	105	11

Potential Nesting/Denning Habitat for Deadwood MIS					
Species	**Acres of Habitat within Existing Roadside Firewood**	**Acres of Habitat within changed Roadside Firewood**	**Acres Dropped**	**New Acres**	**Net Change Acres**
Williamson's Sapsucker	125	122	33	30	-3
Red-naped and Red-breasted Sapsucker habitats are not mapped, but similar to Hairy and Downy Woodpeckers					

Conclusion

Implementation of the ULDR project would alter habitat for the MIS deadwood dependent species. It has the potential to increase habitat for the red-naped sapsucker, red-breasted sapsucker, hairy and downy woodpeckers, and Williamson's sapsucker through lodgepole pine removal in aspen, but remove potential nesting habitat for black-backed and three-toed woodpeckers. Reducing road density and number of dispersed sites would reduce potential habitat destruction and disturbance. Although some woodcutting areas would be dropped new ones would be added. Overall implementation of the Sustainable Transportation System actions increases the amount of habitat impacted by firewood cutting for all deadwood dependent species except the Williamson's sapsucker. The Williamson's sapsucker would have a net decrease of three acres impacted by firewood cutting.

Although any contribution would be negligible at the forest level, the ULDR project may contribute to a negative trend for all deadwood dependent species on the Deschutes National Forest except the Williamson's sapsucker which would contribute a slight positive trend to viability on the Deschutes National Forest.

BIG GAME

Table 14 refers to the big game species selected as MIS for the Deschutes National Forest. Although there are no key elk areas within the project area, they are known to utilize the area. Hiding cover and forage are similar for both species. Mule deer generally tend to utilize smaller patches of hiding cover and prefer browsing shrubs over grazing grasses and sedges. Elk generally tend to utilize larger patches of hiding cover farther from roads and prefer grazing grasses and sedges over browsing shrubs. Both species will utilize all available forage and both species will seek out willows and young aspen. Discussions for these species will be combined as big game.

Table 14. MIS Wildlife Species – Big Game

Species	Nature Serve Status	General Habitat	Indicator For	Species or Habitat Present
Big Game				
Mule Deer	S5	Mosaic of early, forage-producing stages and later, cover-forming stages of forests, i.e. conifer, ponderosa pine, lodgepole pine and mixed ponderosa/lodgepole pine forest with shrub understory, in close proximity	Popular for hunting or viewing	Yes, approx. 3,083 acres of hiding cover
Elk	S5	Mosaic of early, forage-producing stages and older cover-forming stages of forests, in close proximity	Popular for hunting or viewing	Yes, utilizes hiding cover, No Key Elk Areas in project area

Although road densities are high within the project area, the standard is applied at a larger scale implementation unit. On the Crescent Ranger District the subwatershed is the implementation unit. The ULDR project is within two subwatersheds, Bunny Butte and Gilchrist Junction. Both of these

subwatersheds are currently below forest plan guidelines for Forest Service open road densities (2.5 mi/mi²) and above guidelines for hiding cover (30 percent). Bunny Butte subwatershed road density is at 1.4 mi/mi² and hiding cover at 61 percent and Gilchrist Junction subwatershed is at 2.1 mi/mi² and 44 percent hiding cover. Because these subwatersheds are within guidelines, further analysis as described in the Forest Plan (4-58 WL-53 and 4-73 TS-12) at the implementation unit is not necessary. ULDR further reduces road density and would have a minimal reduction on big game cover. The project area is the analysis area for direct, indirect, and cumulative effects.

Core habitat analysis was completed at the Forest-level. This analysis determined habitat that is not potentially disturbed by human presence on roads and trails by buffering disturbance areas along roads. Maintenance Level (ML) 2 through 5 roads, and motorized trails were buffered 656 feet (200 meters) on each side, ML 1 roads and non-motorized trails were buffered 328 feet (100 meters) on each side. Research shows the larger the core area is the more effective habitat is for big game. For deer, secure habitat is generally blocks of at least 0.1 acres scattered on the landscape. For elk, secure habitat blocks need to be 250 acres (Vavra et al. 2005). Because the Forest-level analysis did not have all unauthorized routes, the analysis was rerun for the project area for the existing condition (see Table 15).

Table 15. Existing Big Game Core Habitat Blocks

Category	Number of Existing Habitat Blocks	Average Size of Blocks	Range of Acres within Blocks		Total within Category	Percent of Project Area	Hiding cover within blocks	
Acres		Acres	Min	Max	Acres		Acres	% of cover within Blocks by category
0-10	32	4	0	9	114	2%	49	8%
10-50	19	24	11	48	454	7%	281	45%
50-100	6	62	51	85	375	6%	212	34%
>100	2	140	106	174	280	4%	87	14%
Totals	59				1,223	19%	628	100%
ULDR project area is approximately 6,286 acres with 3,083 acres of hiding cover. Approximately 5,063 acres or 81% of the project area is within a disturbance zone of a road or trail, 20% of hiding cover is within a habitat block.								

Direct, Indirect, and Cumulative Effects

Alternative A - No Action

Habitat conditions would remain the same. Of the 6,286 acre planning area 1,223 acres (19 percent) are within core habitat blocks, leaving the remaining 5,063 acres (81 percent) of the project area within a disturbance zone of a road or trail. Approximately 49 percent (3,083 acres) of the project area is hiding cover. Hiding cover is dispersed across the project area, providing a mix of hiding cover patches in proximity to foraging areas. Table 15 displays the current distribution of core habitat blocks. Currently due to road and trail density and juxtaposition there are two blocks over 100 acres in the project area. Even with a good distribution of cover to forage overall, habitat effectiveness may be low due to the density and juxtaposition of roads and trails. Approximately 20 percent of hiding cover is within core habitat blocks, leaving the majority in proximity to a road. Of the big game cover within the habitat blocks 45 percent are in blocks of 10-50 acres (Table 15). The smaller blocks favor deer over elk. The project area may not support the number of big game it has the potential to due to the density and juxtaposition of roads and trails decreasing habitat effectiveness.

Alternative B-Proposed Action

Lodgepole thinning removes approximately three percent (104 acres) of the hiding cover in the project area leaving 47 percent (2,979 acres). While removing some hiding cover along the stream and within fawning/calving habitat areas, treatments would provide the higher quality forage of early seral grasses and forbs in the spring.

Recreation and access changes results in an increase of 403 acres of the project area in core habitat blocks outside of a disturbance zone of a road or trail from 19 percent (1,223 acres) to 34 percent (2,167 acres). There would be larger core habitat blocks and more that are over 100 acres (Table 16). Tiny habitat blocks of (0-10 acres) are reduced from 32 to 20 acres and small blocks (10-50 acres) would be reduced from 19 to 5 acres. With road closures, most habitat blocks would be consolidated into larger blocks with the largest habitat blocks (>100 acres) increases from two to seven acres. The largest block increases from 280 acres to 1,533 acres increasing habitat effectiveness. Approximately 1,031 acres or 35 percent of the hiding cover within the project area is within habitat blocks, with 65 percent of the habitat within blocks occurring in the largest blocks. Increased habitat effectiveness may increase the number of big game in the project area.

Implementation of the project may alter how big game utilize the analysis area. Disturbance from equipment and people working in and around the riparian areas may cause big game to temporarily move to a different location. Because the movement would be local the animals would return once the disturbance is gone.

Table 16. Proposed Post-implementation Big Game Core Habitat Blocks

Category	Number of Habitat Blocks for Alternative B	Average Size of Blocks	Range of Acres within Blocks		Total within Category	Percent of Project Area	Hiding cover within blocks	
Acres		Acres	Min	Max	Acres	Acres	Acres	% of cover within Blocks by category
0-10	20	3	0	10	64	1%	27	3%
Oct-50	5	28	12	42	139	2%	76	7%
50-100	6	72	53	99	431	7%	243	24%
>100	7	219	108	393	1,533	24%	685	66%
Totals	38				2,167	34%	1,031	100%
ULDR project area is approximately 6,286 acres with 2,979 acres of total hiding cover post-treatment. Approximately 4,119 acres or 66 percent of the project area is within a disturbance zone of a road or trail, 35 percent of hiding cover is within a habitat block.								

Conclusion

Although the project decreases hiding cover by 104 acres, there is sufficient hiding cover (47 percent) and it does not bring the area below forest plan standards (30 percent LRMP 4-58). Reconfiguring the transportation system, closing roads, and closing unauthorized roads and trails increases the number of acres within large core habitat blocks. Hiding cover changes from being in mostly 10-50 acre sized habitat blocks to consolidated within >100 acre blocks improving habitat effectiveness. Short-term disturbance during implementation may change use patterns on a localized and temporarily basis. Over the long-term the ULDR project increases the habitat effectiveness for big game across the project area and contributes to a positive trend in viability of big game on the Deschutes National Forest.

AQUATIC BIRDS

Table 17 refers to the aquatic birds selected as MIS for the Deschutes National Forest. These species were selected as they are popular for hunting or viewing like the great blue heron and is considered a riparian health indicator. The primary habitat features for these species is water centric, as they utilize nesting and/or foraging habitat in and around lakes, rivers, ponds etc. Those species whose habitat is present in the project area are more river/stream centric and includes gadwall, blue-winged teal, cinnamon teal, mallard, northern shoveler, Canada goose, and great blue heron. All aquatic birds are migratory for the Crescent Ranger District.

Table 17. MIS Wildlife Species – Aquatic Birds

Species	Nature Serve Status	General Habitat	Indicator For	Species or Habitat Present*
Aquatic Birds				
Barrow's goldeneye	S3B, S3N	Cavity nester near lakes and ponds; winters lakes, rivers, estuaries and bays	Popular for hunting or viewing	No
Common goldeneye	S4N	Cavity nester; uses ponds, lakes, rivers and costal bays, migrant and/or non-nesting in Oregon	Popular for hunting or viewing	No
Canvasback	S4	Emergent vegetation in complex wetlands	Popular for hunting or viewing	No
Gadwall	**S5**	**Concealed clumps of grasses in meadows and tall grasslands near lakes, ponds or streams**	**Popular for hunting or viewing**	**Yes, habitat not modeled**
Lesser scaup	S3B,S4N	Dry grassy areas near lakes at least 10 ft. deep	Popular for hunting or viewing	No
Northern pintail	S5	Open areas near water	Popular for hunting or viewing	No
Redhead	S4	Freshwater marshes and lakes concealed in vegetation	Popular for hunting or viewing	No
Ring-necked duck	S3	Thick emergent vegetation on shorelines	Popular for hunting or viewing	No
Ruddy duck	S4	Freshwater marshes, lakes, ponds in dense vegetation	Popular for hunting or viewing	No
Blue-winged teal	**S4**	**Marshes, lakes, ponds, slow-moving streams**	**Popular for hunting or viewing**	**Yes, habitat not modeled**
Cinnamon teal	**S5**	**Cover of vegetation near shoreline**	**Popular for hunting or viewing**	**Yes, habitat not modeled**
Green-winged teal	S5S4B	Freshwater marshes with emergent vegetation	Popular for hunting or viewing	No
Wood duck	S4	Cavity nester along swift rivers	Popular for hunting or viewing	No
American wigeon	S5	Wetlands in prairies, parklands, river deltas and ponds with grasslands	Popular for hunting or viewing	No

Species	Nature Serve Status	General Habitat	Indicator For	Species or Habitat Present*
Mallard	**S5**	**Open water with emergent vegetation**	**Popular for hunting or viewing**	**Yes, habitat not modeled**
Northern shoveler	**S5**	**Grassy areas near water**	**Popular for hunting or viewing**	**Yes, habitat not modeled**
Common loon	SHB, S5N	Edges of remote freshwater ponds and lakes	Popular for hunting or viewing	No
Eared grebe	S4	Open lakes and ponds with emergent vegetation	Popular for hunting or viewing	No
Horned grebe	S2B, S5N	Open lakes and ponds with emergent vegetation	Popular for hunting or viewing	No
Pied-billed grebe	S5	Ponds, lakes, channels and sloughs with emergent vegetation	Popular for hunting or viewing	No
Red-necked grebe	S1B, S4N	Lakes and ponds in forested areas	Popular for hunting or viewing	No
Western grebe	S1B, S2S3N	Marshes with open water and lakes and reservoirs with emergent vegetation	Popular for hunting or viewing	No
Common merganser	S4	Cavity nester; found on large bodies of water	Popular for hunting or viewing	No
Hooded merganser	S4	Cavity nester; found on wooded ponds, lakes, and wooded wetlands	Popular for hunting or viewing	No
Canada goose	**S5**	**Variety of habitat: shores of lakes, rivers, and reservoirs especially with cattails and bulrushes**	**Popular for hunting or viewing**	**Yes, habitat not modeled**
Great blue heron	**S4**	**Estuaries, Streams, Marshes, Lakes**	**Riparian Species**	**Yes, approx. 1,364 acres of potential nesting habitat**
*Habitat for individual waterfowl species was not modeled. General waterfowl habitat along rivers was modeled. There is approximately 1,068 acres of streamside waterfowl habitat within the project area.				

Direct, Indirect, and Cumulative Effects

Alternative A - No Action

In the short-term there would be little change in existing habitat. There is approximately 1,068 acres of potential streamside waterfowl habitat and 1,364 acres of great blue heron nesting habitat within the project area. Open ponds, streams, rivers, and wet/dry meadows provide foraging habitat for these species. Great blue herons utilize large trees for nesting, while the waterfowl utilize open grassy areas near the water's edge. Most waterfowl diets consist primarily of vegetation although some animal matter is taken (caddisflies, crustaceans, and mollusks) and the great blue heron hunts the shallow waters of lakes and streams, and wet or dry meadows, feeding on fish, amphibians, aquatic invertebrates, reptiles, mammals, and birds.

Through natural process and a lack of fire along the river, lodgepole pine would continue to reduce grassy areas utilized for foraging and nesting. Upland nesting habitat for the great blue heron would continue to develop. Active recreational use of the area in dispersed sites would continue to disturb streamside habitat.

Alternative B – Proposed Action
Restoration of aquatic habitat would improve nesting for waterfowl and foraging for waterfowl and great blue heron. The removal of encroaching lodgepole pine and installation of instream structures would result in maintenance of higher water levels through the summer and increase in quality and quantity of riparian grasses, sedges, and shrubs. Although encroaching lodgepole pine would be removed, there would be no trees over 21 inches dbh removed, leaving any potential nest trees for the great blue heron.

Reducing the number of roads and limiting sizes of dispersed sites within riparian habitat, would reverse the degradation of these areas. Although recreational use of dispersed sites would continue to disrupt adjacent nesting, improved riparian vegetative conditions would encourage foraging and provide additional viewing opportunities for the public. As past activities have been incorporated into existing condition and there are no past, present, or foreseeable future actions that impact these species, there are no cumulative effects. Implementation of the project would not change the trend in population viability of the gadwall, blue-winged teal, cinnamon teal, mallard, northern shoveler, Canada goose, and great blue heron on the Deschutes National Forest.

BIRDS OF CONSERVATION CONCERN (BCC)

In January 2001, President Clinton issued an executive order on migratory birds directing federal agencies to avoid or minimize the negative impact of their actions on migratory birds, and to take active steps to protect birds and their habitat. Within two years, federal agencies were required to develop a Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service to conserve migratory birds including taking steps to restore and enhance habitat, prevent or abate pollution affecting birds, and incorporating migratory bird conservation into agency planning processes whenever possible. Toward meeting this end the U.S. Fish and Wildlife Service developed the *Birds of Conservation Concern* in 2002 (updated in 2008) and released the U.S. Shorebird Conservation Plan (2004).

The *Birds of Conservation Concern* (BCC) identifies species, subspecies, and populations of all migratory non-game birds that without additional conservation protection actions, are likely to become candidates for listing under the Endangered Species Act of 1973. While all of the bird species included in the BCC are priorities for conservation action, the list makes no finding with regard to whether they warrant consideration for ESA listing. The goal is to prevent or remove the need for additional ESA bird listings by implementing proactive management and conservation plans.

Bird Conservations Regions (BCRs) were developed based on similar geographic parameters. One BCR encompasses the analysis area – BCR 9, Great Basin. Table 18 displays the BCR species for this area, preferred habitat and whether suitable habitat is present in the project area. It also displays the direct and indirect effect of the project on the habitat of the species present.

Table 18. Birds of Conservation Concern for the Great Basin Conservation Region 9

Species	General Habitat Requirements	Impacts to Habitat	
		No Action	Proposed Action
Bald Eagle	**Associated with large bodies of water, forested areas near the ocean, along rivers, and at estuaries, lakes and reservoirs.**	**Discussed in TES section.**	
Black Rosy-finch	Rare in Oregon, found above timberline among bare rock outcroppings, cirques, cliffs, and hanging snowfields.	These habitat types are not found on Crescent Ranger District.	
Black Swift	Nests on ledges or shallow caves in steep rock faces and canyons, usually near or behind waterfalls and sea caves. Forages over forests and open areas in montane habitats.	These habitat types are not found on Crescent Ranger District.	
Black-chinned Sparrow	Erratic presence in ceanothus and oak hillsides in SW Oregon.	These habitat types are not found on Crescent Ranger District.	
Brewer's Sparrow	A sagebrush obligate found in shrublands of contiguous big sagebrush, greasewood, rabbitbrush, and shadescale habitats.	These habitat types are not found on Crescent Ranger District.	
Calliope Hummingbird	**Shrubby montane forest, mountain meadows, second-growth, and willow and alder thickets. Nests are in trees (frequently conifers) at meadow edges or in canyons or thickets along streams (NatureServe 2018).**	**Riparian areas and meadows are found within the project area. Natural processes without fire would result in continued lodgepole pine succession into meadows and riparian areas reducing willow thickets habitats. Recreation next to river also reduces willow.**	**Removal of encroaching lodgepole pine would decrease saplings, but increase potential for willows. Pulling dispersed sites away from riparian areas and restoring/protecting willows would increase habitat.**
Eared Grebe, (nb) non-breeding in this BCR	Found on shallow alkaline lakes and ponds where open water is intermixed with emergent vegetation.	No habitat within the project area.	
Ferruginous Hawk	Occupy habitats with low tree densities and topographic relief in sagebrush plains of the high desert and bunchgrass prairies in the Blue Mountains.	These habitat types are not found on Crescent Ranger District.	
Flammulated Owl	**Mosaic of open mixed conifer (MCD) or ponderosa pine (PPD) forests containing mature or old-growth ponderosa pine with a mix of other tree species and canopy cover <50% for nesting, patches of dense thickets of forest with canopy cover >50% interspersed grassy**	**Suitable habitat for this species in the uplands. There would be no change in habitat with either alternative.**	

Species	General Habitat Requirements	Impacts to Habitat	
		No Action	Proposed Action
	openings creating edge habitat for foraging.		
Golden Eagle	Inhabits shrub-steppe, grassland, juniper and open ponderosa pine and mixed conifer/deciduous habitats. Preferring open areas with cliffs and rock outcrops for nesting and open shrub component for foraging.	The habitat types associated with this species are not found in the project area.	
Greater Sage-Grouse, Columbia Basin DPS, (a) ESA candidate	Sagebrush obligate, found E. of the Cascades. They require large expanses of sagebrush with healthy native understories of forbes.	These habitat types are not found on Crescent Ranger District.	
Green-tailed Towhee	In Oregon, this species prefers vigorous sagebrush and upland shrub stands with high shrub species diversity interspersed with trees. Incidental observations of this species on the Crescent RD have been noted in old clear-cuts on slopes that have become overgrown with manzanita and snowbrush with no overstory.	No habitat within the project area.	
Lewis's Woodpecker	**Open ponderosa pine ≤ 30% canopy cover, cottonwood riparian or oak habitats with an open canopy, brushy understory, dead and down material, available perches and abundant insects. Prefers burned old growth ponderosa pine Altman 2000.**	**Discussed in TES section.**	
Loggerhead Shrike	Inhabits grasslands, pastures with fence rows, agricultural fields, sagebrush with scattered juniper and open woodlands. Requires elevated perches throughout for hunting and nesting.	No habitat within the project area.	
Long-billed Curlew	Open grassland areas E of the Cascades. Found in small numbers in estuaries along the coast.	No habitat within the project area.	
Marbled Godwit, (nb) non-breeding in this BCR	Migrant along the coast prefer coastal mudflats, sandy beaches, wet margins of large reservoirs or brackish lakes and sewage ponds.	The range and habitat types associated with this species are not found within Deschutes National Forest.	
Peregrine Falcon,(b) ESA delisted	**Wide range of habitats, nests on cliff ledges, bridges, quarries.**	**Discussed in TES section.**	

Species	General Habitat Requirements	Impacts to Habitat	
		No Action	Proposed Action
Pinyon Jay	In Oregon, Pinyon-juniper woodland, sagebrush, and scrub oak habitats.	The habitat types associated with this species are not found within Crescent Ranger District.	
Sage Sparrow	Found in southeast. and central Oregon Associated with semi-open evenly spaced shrubs 1-2 m (3.3-6.6 feet) high in big sage up to 6,800 ft.	The habitat types associated with this species are not found within Crescent Ranger District.	
Sage Thrasher	A sagebrush obligate dependent on large patches and expanses of sagebrush steppe and bitterbrush with shrub heights in the 30 -60 cm (11.8-23.6 inches) height. Prefers bare ground over grassy understories.	The habitat types associated with this species are not found within Crescent Ranger District.	
Snowy Plover, (c) non-listed subspecies or population of T&E species	E. of Oregon Cascades a summer resident breeding on alkali flats and salt ponds. On the S. Oregon coast they nest on open sand areas along the upper beach and on un-vegetated spits at mouths of small estuaries.	The habitat types associated with this species are not found within Crescent Ranger District.	
Tricolored Blackbird	Oregon colonies occur in hardstem bulrush, cattail, nettles, willows, and Himalayan blackberries.	Crescent RD is outside of the tri-colored blackbird range. There are no documented sightings of tricolored blackbirds on the Crescent Ranger District.	
Virginia's Warbler	In Oregon, likes high elevation steep-sloped, xeric, pinion- juniper and oak woodland habitats.	The habitat types associated with this species are not found within Crescent Ranger District.	
White-headed Woodpecker	**Ponderosa pine or mixed conifer forests (< 40 percent canopy cover) dominated by old growth ponderosa pine and open habitats where standing snags and scattered tall trees remain.**	**Discussed in TES section.**	
Williamson's Sapsucker	**E. Cascades, mid-to-high elevation, mature open and mixed coniferous - deciduous forests. Snags are a critical component for nesting.**	**Discussed in MIS section.**	
Willow Flycatcher, (c) non-listed subspecies or population of T or E species	**Associated with riparian shrub dominated habitats, especially brushy/willow thickets.**	**Habitat occurs in a patch distribution along the river. Natural processes without fire would result in continued lodgepole pine succession into meadows and riparian areas reducing willow habitats. Recreational use next to river also reduces willow.**	**Removal of encroaching lodgepole pine would increase potential for willows. Pulling dispersed sites away from riparian areas and restoring/protecting willows would increase habitat.**

Species	General Habitat Requirements	Impacts to Habitat	
		No Action	Proposed Action
Yellow Rail	**Found in shallowly flooded sedge meadows at 4,100 – 5,000 ft. with a cover of senescent and live vegetation ~50%.**	**Discussed in TES section (Table 6).**	
Yellow-billed Cuckoo, (w. U.S. DPS)	A rare, irregular visitor east of the Cascades (Marshall et al. 2003). Most reports of this bird in eastern Oregon are from riparian areas dominated by cottonwood and willows (Marshall et al. 2003; NatureServe 2014). No known breeding population in Oregon.	The habitat types associated with this species are not found the project area.	
Yellow-billed Loon	Winters along the coast from Alaska to Baja CA. Transients can be found on inland large bodies of water.	The habitat types associated with this species are not found the project area.	
(Abbreviations: Deschutes National Forest = Deschutes NF, Crescent Ranger District = Crescent RD and ULDR Project = PA), OR = Oregon.			
Birds of Conservation Concern (BCC) come from the U. S. Fish and Wildlife Service Birds of Conservation Concern – BCR 9 (Great Basin) [2008]; (a)ESA candidate, (b) ESA delisted, (c) non-listed subspecies or population of T or E species, (d) MBTA protection uncertain or lacking, (nb) non-breeding in this BCR.			

LANDBIRD CONSERVATION STRATEGY FOCAL SPECIES (LBFS)

The Oregon-Washington Chapter of Partners in Flight participated in developing a publication for conserving landbirds in this region. *A Conservation Strategy for Landbirds of the East-Slope of the Cascade Mountains in Oregon and Washington* was published in June 2000 (Altman 2000). This strategy has been used since its development in planning and projects analysis. The project falls within the Central Oregon subprovince. The species selected in the conservation strategy represent focal species for habitats types or features considered at risk.

Table 19. Landbird Focal Species for Central Oregon

Habitat	Habitat Feature	Focal Species for Central Oregon	Present In the Analysis Area	Species or Habitat affected by project
Ponderosa Pine	Large patches of old forest with large trees	**White-headed woodpecker**	**Yes**	**No**
	Large trees	**Pygmy nuthatch**	**Yes**	**No**
	Open understory with regenerating pines	Chipping sparrow	No	No
	Patches of burned old forest	Lewis' woodpecker	No	No
Mixed Conifer Late-Successional	Large trees	**Brown creeper**	**Yes**	**No**
	Large snags	**Williamson's sapsucker**	**Yes**	**Yes**
	Interspersion grassy openings/dense thickets	**Flammulated owl**	**Yes**	**No**
	Multi-layered/dense canopy	**Hermit thrush**	**Yes**	**No**
	Edges and openings created by wildfire	Olive-sided flycatcher	No	No

Habitat	Habitat Feature	Focal Species for Central Oregon	Present In the Analysis Area	Species or Habitat affected by project
Lodgepole pine	Old growth	**Black-backed woodpecker**	**Yes**	**Yes**
Large Meadows	Wet/dry	Sandhill crane	No	No
Aspen	Large trees with regeneration	**Red-naped sapsucker**	**Yes**	**Yes**
Subalpine fir	Patchy presence	Blue grouse	No	No
Whitebark pine	Old growth	Clark's nutcracker	No	No

Potential Effects on Landbird Focal Species

There is no subalpine fir or whitebark pine habitat within the analysis area. There is also no habitat for the chipping sparrow, Lewis's woodpecker, olive-sided flycatcher, and sandhill crane. Effects of the ULDR project on white-headed and Lewis's woodpecker can be found in the TES section of this analysis, the black-backed woodpecker, red-naped sapsucker and Williamson's sapsucker in the MIS section and the flammulated owl in the BCC section. The remaining Focal Species, pygmy nuthatch, brown creeper, and hermit thrush, all have habitat within the uplands. The ULDR project would not alter habitat for any of these species. There would be no direct, indirect, or cumulative effects for these landbird focal species.

Botany and Invasive Plants

Summary of Findings

There are no known occurrences of Threatened, Endangered, or Sensitive (TES) or Potential (P) botanical species within the ULDR planning area as determined from pre-field reviews and botanical field surveys. Because there are no TES or P species, the Proposed Action will have no impact to TES or P plants and will not contribute to a trend towards federal listing or a loss of viability to the population or species.

Species	No Action	Proposed Action	Species	No Action	Proposed Action
Vascular plants					
Agoseris elata	N/A	N/A	*Piluaria americana*	N/A	N/A
Arnica viscosa	N/A	N/A	*Pinus albicaulis*	N/A	N/A
Astragalus peckii	N/A	N/A	*Potamogeton diversifolius*	N/A	N/A
Botrychium ascendens	N/A	N/A	*Pyrola dentata*	N/A	N/A
Botrychium crenulatum	N/A	N/A	*Rorippa columbiae*	N/A	N/A
Botrychium minganense	N/A	N/A	*Scheuzeria palustris ssp. americana*	N/A	N/A
Botrychium montanum	N/A	N/A	*Schoenoplectus subterminalis*	N/A	N/A
Botrychium paradoxum	N/A	N/A	*Utricularia minor*	N/A	N/A
Botrychium pumicola	N/A	N/A	Bryophytes		
Calamagrostis breweri	N/A	N/A	*Anastrophyllum minutum*	N/A	N/A
Carex capitata	N/A	N/A	*Anthelia julacea*	N/A	N/A
Carex diandra	N/A	N/A	*Blepharostoma arachnoideum*	N/A	N/A
Carex lasiocarpa var. *americana*	N/A	N/A	*Brachydontinum olympicum*	N/A	N/A
Carex livida	N/A	N/A	*Cephaloziella spinigera*	N/A	N/A
Carex retrorsa	N/A	N/A	*Conostomum tetragonum*	N/A	N/A
Carex vernacula	N/A	N/A	*Encalypta brevipes*	N/A	N/A
Castilleja chlorotica	N/A	N/A	*Entosthodon fasicularis*	N/A	N/A
Cheilanthes feei	N/A	N/A	*Haplomitrium hookeri*	N/A	N/A
Collomia mazama	N/A	N/A	*Harpanthus flotovianus*	N/A	N/A
Cyperus acuminatus	N/A	N/A	*Jungermannii polaris*	N/A	N/A
Cyperus lupulinus ssp. lupulinus	N/A	N/A	*Lophozia gillmani*	N/A	N/A
Eucephalis gormanii	N/A	N/A	*Marsupella sparsifolia*	N/A	N/A
Gentiana newberryi var. newberryi	N/A	N/A	*Nardia japonica*	N/A	N/A
Lipocarpha aristulata	N/A	N/A	*Polystrichastrum sexangulare*	N/A	N/A
Lobelia dortmanna	N/A	N/A	*Preissia quadrata*	N/A	N/A
Lycopodiella inundata	N/A	N/A	*Pseudocalliergon trifarium*	N/A	N/A
Lycopodium complanatum	N/A	N/A	*Rivulariella gemmipara*	N/A	N/A
Muhlenbergi minutissima	N/A	N/A	*Schistidium cinclidodonteum*	N/A	N/A
Ophioglossum pusillum	N/A	N/A	*Schofieldia monitcola*	N/A	N/A
Penstemon peckii	N/A	N/A	*Tortula mucronifolia*	N/A	N/A
Piluaria americana	N/A	N/A	*Trematodon asanoi*	N/A	N/A
Lichens					
Texosporium sancti-jacobi	N/A	N/A		N/A	N/A
Tholurna dissimilis	N/A	N/A		N/A	N/A
Fungi					

Species	No Action	Proposed Action	Species	No Action	Proposed Action
Gastroboletus vividus	N/A	N/A		N/A	N/A
Helvella crassitunicata	N/A	N/A		N/A	N/A
Pseudorhizina californica	N/A	N/A		N/A	N/A
Ramaria amyloidea	NI	NI		N/A	N/A
Rhizopogon alexsmithii	N/A	N/A		N/A	N/A

NI = No Impact, N/A= No habitat or species present

Introduction

The following Biological Evaluation addresses potential effects on Threatened, Endangered, Sensitive (TES) and Proposed (P) botanical species from proposed activities within the Upper Little Deschutes Restoration (ULDR) planning area. This document summarizes the existing information on TES occurrences, as well as the results of extensive botanical surveys throughout the planning area. Sensitive plants are those species identified by a U.S. Forest Service Regional Forester for which population viability is a concern, as evidenced by either a significant current or predicted downward trend in population numbers or density, or in a habitat capability that would reduce a species' existing distribution (Forest Manual 2670.5). The sensitive species list for Region 6, Pacific Northwest, was last updated on July 7, 2015 and from this the Deschutes/Ochoco list of TES species was also revised. This list includes vascular plants and non-vascular species such as bryophytes (mosses and liverworts), fungi (e.g. mushrooms), and lichens. The Zone of Influence for discussion of direct, indirect, and cumulative effects from treatments is bounded by the project area for all species.

Methodology

Pre-field review - A pre-field review for botanical species was conducted in May 2017 to determine if there were any known sites of TESP species located within the ULDR planning area. The review consisted of checking the following database records for documented occurrences:

Information Sources

- Regional Forester's (R-6) Sensitive Plant Species List (revised July 2015)
- Deschutes National Forest Sensitive Plant List (revised July 2015)
- Oregon Biodiversity Information Center: Known rare plant occurrences within the Crescent Ranger District (data request May and December 2017)
- NRM (Natural Resource Manager) TESP database - Element Occurrence and Survey records for TESP plants on the Deschutes National Forest (accessed on May and December 2017)
- Botany Survey Records, Crescent Ranger District

Habitat analysis – A habitat analysis was conducted comparing habitat requirements of the Deschutes TES species with the known plant communities within the planning area.

Botanical surveys – During the pre-field review it was found that no botanical surveys had ever been conducted within the ULDR planning area. Preliminary surveys were conducted in the summer of 2015 and completed during the 2017 field season. These surveys were conducted by the District Botanist and an experienced Biological Technician. A general survey method was used, where traverses were made through pre-determined project units. All survey data was entered into NRM TESP-IS, the Forest Service's national database for natural resource information.

Environmental Consequences

Direct, Indirect, and Cumulative Effects

As there are no TES or P occurrences within the ULDR planning area, there will be no direct, indirect, or cumulative effects from either the No Action or Proposed Action Alternative.

Invasive Plant Risk Assessment

Summary
From the pre-field review of data sources and recent botanical surveys, only one documented invasive plant site was found within the ULDR planning area. This is a small (less than 100 ft^2) infestation of butter-n-eggs (*Linaria vulgaris*) along a section of the diversion ditch near the existing pond. This site has been treated annually since 2015 and was found to have only five plants in 2017. As mitigation this infestation will be monitored during restoration work to ensure that soil is not moved from the site, thereby preventing noxious weed material from being introduced into another area.

Introduction
Non-native invasive plants are aggressive species capable of degrading environmental quality or causing economic harm. Invasive plants have developed many characteristics, such as rapid growth rates, high seed production, and extended growing periods that give them advantages over native plants. Such invasive plants are undesirable in forest ecosystems because they tend to displace native plants, degrade habitat for wildlife species, contribute to soil erosion, and potentially reduce the value of recreational experiences.

The risk assessment focused on several factors that determine the potential for the spread of invasive plants in a project area, the first and foremost being the number of existing invasive sites within the planning area and whether or not those infestations can be avoided during implementation. Other key factors are related to the amount of ground disturbance associated with activities. This includes the number of unauthorized trails and system roads to be closed, as well as the amount of proposed disturbance from various treatments, such as log placements, structure removal, and tree thinning.

Existing Condition

Resource Indicator - Known sites of invasive plants
There is only one documented invasive site within the ULDR planning area; a small infestation of butter-n-eggs (*Linaria vulgaris*) along a section of the diversion ditch to be closed. This site has been treated since 2015 and has been nearly eradicated (with only five plants found in 2017). No other infestations were found during field surveys conducted in 2017. Mullein (*Verbascum thapsus*) and bull thistle (*Cirsium vulgare*) were found sporadically as isolated individuals during surveys. These two species are considered low-priority for treatment as they tend not to spread from disturbed areas into adjacent forest stands.

Resource Indicator and Measure 2 – Ground disturbance
The major source of ground disturbance within the planning area comes from recreational use from the public. Most of this consists of unauthorized OHV trails and roads, which are discussed in the following section. Other ground disturbance is seen with dispersed camping sites and along river section near these campsites. In these areas native vegetation has been degraded through vehicles parking in riparian areas to access the river, and from swimming hole sites, where banks have been denuded from repeated use from swimmers.

One notable area of extreme ground disturbance can be found between the 010 road and the Little Deschutes River in the southern project area. Here there are several areas, the largest an acre in size, where all the vegetation has been obliterated from years of repeated use from OHV riders.

Currently these areas do not have any invasive plant infestations; however, these sites are more vulnerable to invasions due to the highly disturbed soil and a lack of native plant cover.

Resource Indicator and Measure 3 – Unauthorized and System Roads
The ULDR planning area is characterized by a high density of unauthorized roads and trails which have been created by the public through repeated motorized use off established Forest Service roads. From field surveys and GIS work it has been determined there are 22.1 miles of these unauthorized roads (see Transportation Section).

Because roads and vehicles can act as vectors by which invasive plants move into new areas (Tyser and Wooley 1992, Hodkinson and Thompson 1997, Lippe and Kowarick 2007, Rew and Pollnac 2010, Ansong and Pickering 2013), road density is a key component in determining the current and potential risk for invasive plants. Field studies have demonstrated that higher densities of invasive plants can be found along roads when compared to adjacent interior land areas (Parendes and Jones 2000, Mortensen et al. 2007, Davies et al. 2013). Both open and closed roads were included during botanical surveys in the planning area. While one may have expected that infestations would be found along these roadside edges, this was not observed during field surveys. Roadside edges were found to be generally well vegetated with native vegetation. At most only sporadic, individual plants of mullein or bull thistle were seen along roadways.

The amount of vehicular traffic and maintenance on the road system in the ULDR area is also a factor in determining the risk for invasive plants. There are both summer and year-round residences within the southern project area, on both sides of the Little Deschutes River. The Gulick Road (6125 road, part Forest Service and part private ownership) is the main thoroughfare for residents to access their properties. Maintenance on the Gulick road consists of grading at least once a summer and plowing (private under a road use permit) during the winter.

Environmental Consequences

Alternative A – No Action
Under the No Action Alternative, the proposed treatment activities of the ULDR project would not be implemented. Under this scenario, the existing low level of invasive plant infestation would continue throughout the planning area. Although there is persistent use from the public within the planning area (camping, swimming, and OHV use), this use has not resulted in any significant invasive plant infestations. This would continue with the No Action Alternative.

Alternative B – Proposed Action
Resource Indicator 1 – Current infestation sites and whether are not they can be avoided
There is only one infestation site within the planning area which has been under treatment since 2015 and is nearly eradicated. As mitigation this infestation will be monitored during restoration work to ensure that soil is not moved from the site, thereby preventing noxious weed material from being introduced into another area. With this mitigation in place the Proposed Action will not result in an increased risk of invasive plant infestation.

Resource Indicator 2 – Ground disturbance
A key factor in assessing the risk for invasive plants is the acreage (quantitative measure) and intensity (qualitative measure) of ground disturbance associated with various treatments. The Proposed Action consists of restoration work that will involve some degree of ground disturbance associated with various treatments. Planting native vegetation will have minimal ground disturbance, while decommissioning OHV trails and roads will involve more extensive soil disturbance through the use of heavy equipment to rip road beds and place boulders. Disturbed areas have a higher potential for the colonization of invasive plants as such species physiological and morphological adaptations that allow them to rapidly colonize and proliferate in disturbed areas (Hobbs and Huenneke 2009; USDA Forest Service 2017).

Resource Indicator 3 – Roads

Roads and vehicles act as key vectors by which invasive plants move into new areas, so road density is a key component in determining the current and potential risk for invasive plants. Under the Proposed Action, 9.3 miles of Forest System roads and 17.1 miles of unauthorized roads would be decommissioned and revegetated. Along with other road changes, the existing road density within the planning area would be reduced from 5.2 mi/mi^2 to 3.1 mi/mi^2. By decreasing the density of roads, especially unauthorized ones, the infestation risk is reduced through less vehicle traffic and road maintenance.

Cumulative Effects

Spatial and Temporal Context for Effects Analysis

The ULDR planning area provides the spatial boundary for analyzing the cumulative effects to invasive plants due to the site specificity of such sites. The timeframe for effects is 20 years, which is based upon the estimated duration for the natural regeneration of disturbed sites.

Past, Present, and Reasonably Foreseeable Activities Relevant to Cumulative Effects Analysis

Table 4 provides a summary of related projects and activities that have the potential to either decrease or increase the cumulative risk of invasive plants throughout the ULDR planning area. Projects such as timber harvesting have the potential to increase infestation risk due to increased ground disturbance and the movement of equipment. BLT was included in the existing condition, however, during implementation Forest Service mitigations were effective in preventing the introduction and spread of infestations. This included annual monitoring within timber sale units to verify that noxious weeds were not present or to document and rapidly treat any infestations that may have resulted from harvesting activities.

Other projects have the cumulative effect of decreasing the potential for invasive infestations. This includes the 2005 and 2011 Invasive Plant EIS for the prevention and treatment of invasive plant sites. These actions have been highly effective in reducing the extent of existing infestations and quickly identifying and treating new infestations to prevent their further spread.

Other Guidance

This project would adhere to the Standards and Guidelines outlined by Forest Direction in the Region 6 Invasive Plant Record of Decision and Final Environmental Impact Statement (2005). This project is consistent with the Invasive Species Executive Order (EO) 13112 of February 3, 1999. Project Design Features are in Chapter 2 of this EA.

Fisheries and Aquatics

Summary

There are no anadromous or Endangered Species Act (ESA) species or their habit within the project area.

Table 20 Threatened, Endangered and Sensitive Fish Species

Species	Scientific Name	Status	Occurrence	Effects Determination
Columbia River Bull Trout	*Salvelinus confluentus*	T	HN	**NE**
Interior Redband Trout	*Oncorhynchus mykiss*	S	HD-unoccupied historic habitat	**NI**

Status	
E	Federally Endangered
T	Federally Threatened
S	Sensitive species from Regional Forester's list
Occurrence	
HD	**Habitat Documented** or suspected within the project area or near enough to be impacted by project activities
HN	**Habitat Not** within the project area or affected by its activities
Effects Determinations	
NE	No Effect - Threatened and Endangered Species
NI	No Impact- Sensitive Species

This documents the review and findings of the Forest Service planned programs and activities for possible effects on species (1) listed or proposed for listing by the USDI Fish and Wildlife Service (USFWS) as Threatened or Endangered; or (2) designated by the Pacific Northwest Regional Forester as Sensitive. It is prepared in compliance with the requirements of Forest Service Manual (FSM) 2630.3, FSM 2672.4, and the Endangered Species Act of 1973, as amended (ESA; Subpart B; 402.12, Section 7 Consultation). This section summarizes the analysis of the effects from implementing the actions proposed for ULDR Alternative B on fish populations, critical habitat, and habitat for threatened bull trout (*Salvelinus confluentus*), and sensitive redband trout (*Oncorhynchus mykiss*).

Management Guidance

Management of this project, as it relates to aquatic function, is directed by the Inland Native Fish Strategy (INFISH 1995), the Deschutes Land and Resource Management Plan (USFS 1990), the Clean Water Act (1972), 2010-2013 Deschutes and Ochoco Programmatic Biological Assessment and Executive Orders 11988, 11990, and 12088. Additional scientific guidance and background information is available within various watershed analyses and the National Best Management Practices for Water Quality Management (USFS 2012).

INFISH

Riparian Habitat Conservation Area (RHCA) standard widths are applied based on the category of stream, and watershed classification as defined by INFISH, pages A-5 and A-6. RHCA widths for this project are; Category 1 areas (fish-bearing streams) will consist of a riparian area that incorporates the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site potential trees, or 300 feet slope distance (600 feet, including both sides of the stream channel), whichever is greatest.

Riparian Management Objectives (RMOs; page A-4 by INFISH), have been established to provide the criteria against which attainment or progress toward attainment of the riparian goals is measured. The interim RMOs provide the target toward which manager's aim as they conduct resource management activities across the landscape. It is not expected that the objectives should be met instantaneously, but rather would be achieved over time.

Standards and guidelines that pertain to water and this project, as established on page E-7 by INFISH are as follows;

- TM-1 – Prohibit timber harvest, including fuelwood cutting in RHCAs, except as summarized below.
    - Where catastrophic events such as fire, flooding, volcanic, wind, or insect damage result in degraded riparian conditions.
    - Apply silvicultural practices for RHCAs to acquire desired vegetation characteristics where needed to attain RMOs.

While harvest is not proposed within the RHCAs of the Little Deschutes River, thinning of encroaching lodgepole is proposed to improve riparian vegetation within this area. Future maintenance work may include re-entry into the meadows to lop and scatter the seedlings/sapling to maintain the meadow. Maintenance/repair and/or expansion of the instream structures may be required as the site evolves.

The Clean Water Act (1972) and Sections 319 and 303(d)

The objective of the Clean Water Act (CWA) is to restore and maintain the chemical, physical, and biological integrity of all waters to protect the Beneficial Uses as documented according to criteria by the Oregon Department of Environmental Quality (ODEQ). A beneficial use is a resource or activity that would be directly affected by a change in water quality or quantity. Beneficial uses are defined on a basin scale in the Oregon Administrative Rules for water quality and cover large areas of land. The beneficial uses for this project are derived from the entire Deschutes Basin (approximately 6.9 million acres). Under Section 319 of the 1987 CWA Amendments, states are required to determine those waters that will not meet the goals of the CWA, determine those non-point source activities that are contributing pollution, and develop a process on how to reduce such pollution to the "maximum extent practicable." Section 303(d) of the CWA requires that a list be developed of all impaired or threatened waters within each state. The ODEQ is responsible for compiling the 303(d) list, assessing data, and submitting the 303(d) list to the Environmental Protection Agency (EPA) for federal approval.

Within or adjacent to the planning area the following waterbodies are on the 2010 303(d) list.
Little Deschutes River – listed for exceedances of stream temperature and dissolved oxygen (D.O.).

Executive Orders

The following Executive Orders pertain to this project;

- Executive Order 12088 requires Federal compliance with pollution control standards (i.e. the Clean Water Act).
- Executive Order 11988 requires agencies to avoid adverse impacts associated with the occupancy and modification of floodplains.
- Executive Order 11990 requires agencies to avoid adverse impacts associated with the destruction or modification of wetlands.

Joint Aquatic and Terrestrial Programmatic Biological Assessment (2010-2013)
Project Design Criteria (these are not standards or guidelines) for Oregon and Columbia spotted frogs calls for;

- No reduction in the amount of vegetative cover to the point of creating streambank instability. The minimum threshold is 90 percent stable streambanks.
- No measurable increase in stream temperature due to loss of shade.
- No alteration of flow regime that may lead to a measurable increase in stream temperature.

National Best Management Practices for Water Quality Management on National Forest System Lands (April 2012). The Project Design Features in this document were developed to comply with the National Core BMPs. These core BMPs are meant to provide direction in the development of project specific practices such as the Project Design Features in this document. An extensive list of project applicable BMPs are included in the Hydrology Report on file.

Permit Process
The proposed instream activity for the Upper Little Deschutes Restoration project requires a permit. That individual permit for the Clean Water Act (CWA) 404 would be obtained from the Division of State Lands and the Army Corp of Engineers.

Affected Environment
The project lies with six 6th field watersheds, but only two are within the project area where instream work will occur; Gilchrist Junction-Little Deschutes River (170703020105) and a very small portion of Town of Gilchrist-Little Deschutes River (170703020106). There are no key watersheds within the project area.

The Little Deschutes River (105 miles total) originates out of the Mount Thielsen Wilderness, the first 12 miles are designated as Wild and Scenic. From there the gradient drops significantly into a meandering stream flowing through the subdivision of Two Rivers North and under Highway 58 into the project area between Highway 58 and Crescent Cutoff road and flows into the Deschutes River near Sunriver, Oregon.

Effects
Since the project area is within unoccupied habitat for either bull trout or redband trout, project activities would not directly impact ESA listed or Regionally Sensitive fish species. Bull trout have been extirpated from the Little Deschutes River system. The nearest redband trout can be found in Crescent Creek, whose confluence lies approximately 6.2 miles (10 km) downstream and below a mill pond and dam that likely poses a complete passage barrier.

It is anticipated that during implementation, project activities would have the potential to affect fine sediment inputs, timing and duration of flow, and shade values. The felling of trees, skidding, and placement within the stream channel has the potential to displace fine soils and increase the probability of mobilization to surface waters. Fine sediment delivery to streams has been shown to adversely affect fish by abrasion of gill tissue, reduced ability to feed, decreased spawning success due to embedding the stream substrates, and reducing oxygenation of those substrates. Based on personal experience in restoration work, it is common to have short duration increases in fine sediment delivery. Unless the inputs have a high level of clay, the visible sediment plume does not often travel downstream more than a kilometer (approximately 0.62 miles). Bull trout and redband trout have been absent from the project area for several decades. Any pulse increases in sediment production are not expected to adversely affect listed fish species or their habitat.

The felling of lodgepole pine trees within the riparian area of the Little Deschutes River will likely result in a short-term (less than five years) decrease in shading from the tree canopy. However, it is expected that as a result of project activities, there would be a long-term increase in stream shading and a decrease in summer maximum stream temperatures. Increased long-term shade is expected to occur as a result of improved soil moisture levels being able to support riparian vegetation in a broader area, and improved shading as a result of riparian planting and the degree of shading provided by riparian plants such as willow, aspen, and sedge. Additionally, as a result of an elevated alluvial aquifer level, it is expected that there would be improved hyporheic exchange[14] and therefore a greater degree of cooling due to groundwater inputs during summer months. This will likely also result in a greater degree of thermal and spatial heterogeneity in aquatic habitats. The anticipated short-term reductions in shade provided by the removal lodgepole pine trees on the valley floor are not expected to have a measureable effect on water temperatures or adversely affect listed species or their habitats.

Unauthorized Bridge Removals- The removal of two unauthorized bridges will result in less sediment entering the Little Deschutes River directly adjacent to the bridges. The removal and restoration of the sites will also result in loss of access to unauthorized roads and trails further improving water quality. There is potential for sediment to enter the river during the process of removing the bridges and restoring the banks however, any sediment is expected to be minimal and only present during the time of construction.

Management of unauthorized trails, roads, and dispersed recreation will likely reduce chronic fine sediment inputs and promote the reestablishment of riparian vegetation. These changes would be expected to improve water quality at a local scale and improve riparian function.

Effects Determination

The ULDR planning area provides the spatial boundary (zone of influence) for analyzing the cumulative effects to fisheries and aquatic species. There are no expected adverse effects to ESA listed species or regionally sensitive aquatics resource from this project for the following reasons;

- ESA listed fish species and regionally sensitive fish species are no longer found within the project area. High levels of non-native game fish have likely displaced these species from the Little Deschutes River system upstream of Gilchrist.
- The nearest likely location occupied by redband trout would be in the Little Deschutes River at the confluence with Crescent Creek (approximately 6.2 miles (10 km) downstream).
- The nearest occupied bull trout waters are in the Odell drainage which is more than 12.4 miles (20 km) away and in a separate twelfth field subwatershed.

There would be some effects to the stream from implementation of project activities that would likely result in short-term (less than two months) increased amounts of fine sediment delivery, and disturbance to riparian vegetation. The felling and placement of large wood along with the decommissioning of the illegal diversion ditch would likely result in increased amounts of fine sediment mobilization in the short-term. Following project completion, it is anticipated that the

[14] **Hyporheic exchange** is the mixing of surface and shallow subsurface water through porous sediment surrounding a river and is driven by spatial and temporal variations in channel characteristics (streambed pressure, bed mobility, alluvial volume and hydraulic conductivity). Hyporheic exchange in mountain rivers I - USDA Forest Service *https://www.fs.fed.us/rm/pubs_other/rmrs_2009_tonina_d001.pdf*

shallow groundwater elevation would be elevated (as a result of large wood placement and displacement of water) which would support riparian vegetation growth and the colonization/stabilization of disturbed surfaces.

It is anticipated that implementation of this project, with the placement of the instream structures, would improve shallow groundwater storage, and therefore improve hyporheic exchange and restoration of a more natural (pre-European American disturbance) flow regime for this area. In addition, the elevated shallow groundwater and increased hyporheic exchange results in greater diversity in surface water temperatures. This temperature variation can be beneficial to fish. In the warm summer months the cold water pockets would hold more oxygen thus fish expend less energy to maintain body temperature and are less prone to disease. In the colder months the warmer pockets provide a place of refuge.

With the increase in riparian vegetation, there would be an increase in allochthonous[15] (plant litter- ie. leaves, branches etc.) inputs into the stream which would decompose and provide sources of nutrients/food to fish).

Overall this project would comply with guidance outlined in INFISH (1995), the Deschutes Land and Resource Management Plan (USFS 1990), the Clean Water Act (1972), the 2010-2013 Deschutes and Ochoco Programmatic Biological Assessment, and Executive Orders 11988, 11990, and 12088.

[15] Riparian organic matter such as leaves, branches, bark from trees that falls into the water, decomposes and provides organic matter for food to fish and other aquatic species. 2005. Naiman et al. Riparia: Ecology, Conservation, and Management of Streamside Communities.

Transportation

SUMMARY

One of the goals proposed with this project is to reduce the amount of roads but still provide access to the frequently used recreational areas within the project boundary. As a result of the road changes (See Table 2 for the entire list) proposed through Alternative B, a National Forest Road System was established to best attain this goal. Open (ML 2) road miles will slightly increase to provide access to recreational opportunities where interest was expressed through collaboration efforts and resource damage was not a concern.

Table 21. Summary of Existing National Forest System (NFS) and Unauthorized Roads

Existing Roads	Approximate Miles
Unauthorized Road Miles	22.11
NFS Road Miles	46.32
Total Road Miles (NFS and Unauthorized)	68.43
There are no private and/or other jurisdiction roads within the project area	

Resource Indicators and Measures (Road Density)

Open road density must be managed to achieve the Forest's wildlife objectives. Density guidelines are not intended to be objectives in themselves, but means to accomplish wildlife resource objectives. Therefore, open road densities will be evaluated in relation to the needs and sensitivity of site-specific wildlife habitats and populations. Due to the project not being part of a management area that includes specific road density guidelines, the deer summer range guideline of 2.5 mi/mi^2 (miles per square mile), as an average over the entire implementation unit, is assumed (Land and Resource Management Plan, Deschutes National Forest 1990). There is not a specific guideline for Riparian Habitat Conservation Areas (RHCA) but it was included in the evaluation of road density within the project area.

Table 22. Existing Road Density - (Mile/Square Mile)

ULDR Project Boundary	Area (Sq. Mi.)	Total Closed Road Density (NFS ML 1)	Total Open Road Density (includes open unauthorized roads)
Entire Project Area	9.82	1.72	5.25
RHCA within ULDR Boundary	1.68	0.99	4.11

AFFECTED ENVIRONMENT

The maps displayed in Chapter 2 are of the existing National Forest Road System. It does display private/other roads but this data may not be fully accurate as a result of not being part of the National Forest Road System.

Location and Distribution

The Upper Little Deschutes Restoration (ULDR) project area contains approximately 69 miles of roads under Forest Service jurisdictions (this includes unauthorized roads on National Forest lands). The road system, in general, is evenly distributed throughout the project area, with a slightly greater abundance in the northern portion of the project area due to a larger degree of access to the Little

Deschutes River. Table 21 displays the summary of the current road system, including unauthorized roads.

Age and Development History of the Transportation System

Portions of 6125 (Gulick) Road appear on a historical map from 1915 showing timber holdings in Cook, Klamath, and Lake Counties. It is unknown when the road was originally constructed. Some additional roads within the project area appear on a 1935 Chemult, Oregon topographic map. Most of the roads appear to be in different locations than they currently exist due to land exchanges and river crossings that no longer exist. The bulk of the primary road system within the project area has been in existence for more than 50 years. With few exceptions, the roads were constructed for access to timber harvest areas.

Primary Destinations of Road System Users

The bulk of the roads within the project area do not generally serve any specifically defined destinations. Rather, they provide access to areas of interest for various users. For land managers, these roads serve as access to areas where reforestation or vegetative management activities are ongoing or planned. For hunters, they provide access to popular hunting areas. For matsutake mushroom pickers, these roads provide entry into a number of picking areas in the southern portion of Crescent Ranger District. Other recreational enthusiasts enjoy these roads for summer access and winter sports.

The distribution of existing roads by maintenance level within the project area is displayed in Table 23. This mileage includes the unauthorized roads that were identified within the project boundary during analysis but may not include all unauthorized road miles that currently exist.

Table 23. Miles of Existing National Forest System Roads by Maintenance Level (ML)

Maintenance Level	Approximate Miles
ML 1 - BASIC CUSTODIAL CARE (CLOSED):	16.85
ML 2 - HIGH CLEARANCE VEHICLES (OPEN):	29.47
Total	**46.32**
*There are no maintenance levels 3-5 roads within the project boundary.	
*All roads are native surfaced within the project boundary.	

Table 24. Summary of Proposed Final National Forest Road System

Maintenance Level	Approximate Miles
ML 1 – BASIC CUSTODIAL CARE (CLOSED):	13.60
ML 2 – HIGH CLEARANCE VEHICLES (OPEN):	30.24
ADMINISTRATIVE USE ONLY (CLOSED):	2.96
PERMITTED DRIVEWAY ACCESS (OPEN BUT NOT NFS ROADS):	0.31

Table 25. Proposed Final Road Density - (Mile/Square Mile)

ULDR Project Boundary	Area (Sq. Mi.)	Total Closed Road Density (NFS ML 1)	Total Open Road Density (NFS ML 2)
Entire Project Area	9.82	1.69	3.11
RHCA within ULDR Boundary	1.68	0.99	2.13

ENVIRONMENTAL CONSEQUENCES

Direct and Indirect Effects

Alternative A – No Action

Under Alternative A, the existing road system would experience no change to its current status and condition (Figure 9 and Figure 11). Roads that are currently in a stored status (ML 1) would remain closed and open roads (only ML 2 in this project area) would continue to provide access for recreational, commercial, and administrative functions in the same manner that they currently do. Open roads would receive no maintenance beyond that which is normally scheduled, which is generally devoted to higher standard roads.

Roads in close proximity to riparian areas have the potential for erosion resulting in sedimentation into the Little Deschutes River. There has also been a decrease in wildlife habitat effectiveness on the landscape due to an increase in unauthorized road density that continues to rise. The spread of invasive plant species may increase with the additional opportunities for vehicles to disperse seeds (See the Invasive Plant Risk Assessment Report for additional information).

Alternative B – Proposed Action

The maps displayed in Chapter 2 (Figure 10 and Figure 12) are the proposed National Forest Road System after implementation of Alternative B, the Proposed Action. The legend explains the treatments but the most note-worthy is the black lines that represent the open road system (ML 2). Table 2 in Chapter 2 describes the proposed road changes to the National Forest Road System in the proposed action.

As a result of the proposed road changes the direct effects that may be seen are; disturbed soils and vegetation in areas where decommissioning and closure treatments occur, a decrease in dispersal of invasive plant species, fewer opportunities for some recreational access as it currently exists, and more accurate mapping and Forest Service data as a result of closer analysis of the current state of the National Forest Road System.

The indirect effects that may be seen are; revegetated disturbed areas on decommissioned and closed roads that will occur over time, recreational opportunities for a broader group of users as a result of more land area without roads, an increase in effective wildlife habitat areas, a decline in the erosion potential of roads within the riparian area (See Figure 10 & Figure 12 and Table 2 for specific roads within these areas that are proposed for decommissioning or closure).

Cumulative Effects

The spatial boundaries for analyzing the cumulative effects for roads are the project area boundaries. Table 5, the Past, Present, and Reasonably Foreseeable Future Actions has been reviewed for cumulative effects. The Travel Management Project for the Deschutes and Ochoco National Forests and the Crooked River National Grassland (2011) further designated routes and areas for operation of

highway-legal and non-highway-legal motor vehicles on the entire forest and, by doing so, created a prohibition on operation of various types and classes of motorized vehicles where such use was not specifically designated. As a result of these decisions, an established system of roads and trails (there are no designated trails within the ULDR project area) on which motorized use is allowed has been identified on Crescent Ranger District. Implementation of Alternative B would result in an increase of open (ML 2) road miles within the project boundary by 0.77 miles that would be designated for both highway-legal and non-highway-legal vehicle use.

The 2012 Crescent Roadside Firewood Strategy for personal firewood cutting along open roads (as defined by the Deschutes Motor Vehicle Use Maps) may or may not be impacted. Open road systems will be slightly altered [with some being closed (ML 1) and others being opened (ML 2)] but as these open firewood areas change as a result of available firewood (as identified within the firewood synopsis) there may be very little impact within the project area. As stated above, the open (ML 2) road system would increase by 0.77 miles therefore slightly expand the open roadside firewood area (if the area is determined to remain open to roadside firewood cutting).

Project Design Features and Mitigation Measures

Within the Management Area 9 (MA9) Scenic Views identified in the Land and Resource Management Plan, Deschutes National Forest, 1990 (Forest Plan 4-121), there are two unauthorized roads that are proposed to be decommissioned as well as any additional unauthorized roads discovered in the future. The proposed decommissioning activities will accomplish the goal of this management area by providing visitors with high quality scenery that represents the natural character of Central Oregon.

Due to the project not being part of a key management area for wildlife that includes specific road density guidelines, the deer summer range guideline of 2.5 mi/mi^2, as an average over the entire implementation unit, is assumed (Land and Resource Management Plan, Deschutes National Forest 1990 TS-12 Forest Plan 4-73). Since, as the Land and Resource Management Plan states, "guideline densities will be used as thresholds for a further evaluation and will not serve as the basis for assessing conformance with the Forest Plan," a Travel Analysis Report (Travel Analysis Report Upper Little Deschutes Restoration, February 2018) was completed to recommend the road treatments put forth in the proposed action.

To see all of the BMP's that apply to road related activities please refer to: *National Best Management Practices for Water Quality Management on National Forest System Lands*, Forest Service FFS-990a, April 2012.

Through the NEPA/roads analysis process it was determined that there are private residents who are adjacent to National Forest System lands with existing roads (driveways that at this time are considered unauthorized roads) accessing their private parcels (the sole purpose is providing ingress and egress for that private parcel) across National Forest System lands. The Crescent Ranger District sent out two letters (4/07/17 and 8/29/17) requesting information from private landowners regarding access routes. The Crescent Ranger District Road Manager/Transportation Planner and Recreation and Lands Special Uses Permit Administrator met with numerous private landowners within the ULDR project area to discuss in detail their options (see Transportation Report) to ensure compliance with 36 Code of Federal Regulations (CFR) 251.50, Subpart B – Special Uses. Different scenarios may require additional options that will be evaluated on a case-by-case basis and any additional roads discovered would be considered unauthorized and decommissioned (with appropriate analysis by District specialists).

The goal of decommissioning unneeded roads within the Upper Little Deschutes Restoration project area is removal from the National Forest Road System through reestablishing vegetation and, if necessary, initiating restoration of ecological processes interrupted or adversely impacted by the unneeded road *(Forest Service Manual 7700 – Travel Management, Chapter 7730, 7734.1 – Decommissioning Treatments, 2014).*

Maintenance Level 1 (closed) roads are roads that have been determined necessary intermittent transportation facilities and are held in a stored status between intermittent uses. Treatments for closing a road to vehicular traffic may mimic decommissioning treatments. The most common treatment being blocking the entrance(s) and/or scattering slash on the roadbed. For closure methods to be successful each road may be evaluated for the surrounding terrain and vegetation type and methods chosen accordingly.

All of the proposed road treatments will occur only on National Forest System lands.

Roads listed as unauthorized may be decommissioned to the level that is necessary to protect resources. There may be additional unauthorized roads that are not identified on the map that may receive the same treatment after consulting with District Specialists (see Chapter 2 for Project Design Features).

Cultural Resources

Management Direction

Management direction for cultural resources is found in the Deschutes National Forest Resource Management Plan, in the Forest Service Manual section 2360, in Federal Regulations 36CFR64 and 36CFR800 (amended December 2000), and in various federal laws including the National Historic Preservation Act (NHPA) of 1966 (as amended), the National Environmental Policy Act, and the National Forest Management Act.

In general, the existing management direction asks the Forest to consider the effects on cultural resources when proposing projects that fall within the Forest's jurisdiction. Further direction indicates that the Forest will determine what cultural resources are present on the forest, evaluate each resource for eligibility to the National Register of Historic Places (National Register), and protect or mitigate effects to resources that are eligible, or potentially eligible.

Existing Condition

Of the 6,286 acres within the Upper Little Deschutes Restoration (ULDR) project area, 3,582 acres (57%) have been subject to previous adequate surveys. An additional 760 acres (1%) have been surveyed within the project area but under surveys which are no longer considered adequate due to changes in methodology. Previous surveys have adequately inventoried 1,804 acres (80%) of the 2,241 acres of high probability areas within the project area. An additional 99 acres were surveyed for this project in areas where activities were proposed but no adequate survey existed. Therefore, 100% of the areas identified for proposed ground disturbing activities has been surveyed.

Thirty-eight sites have been previously recorded within the bounds of the ULDR project. At this time, seven are considered eligible for the National Register; 21 are considered not eligible for the National Register; and 10 are unevaluated. Any unevaluated sites will be treated as National Register eligible until a formal Determination of Eligibility can be made in the future. The majority of these sites (26 sites) are historic in nature representing refuse scatters and historic structural remains; seven sites are pre-contact lithic scatters, and three sites are considered multicomponent with both historical and pre-contact artifacts/features.

ENVIRONMENTAL CONSEQUENCES

Alternative A-No Action Alternative

Under this alternative, no management actions or treatments would take place connected to the ULDR project. Custodial activities would continue, such as routine maintenance of roads; however, no hydrologic or forest restoration would be implemented to accomplish project goals. Without the placement of instream structures and the demolition of diversion ditches, the water levels and channels of the river would continue to fluctuate, eroding and transporting bank material downstream. This erosion has the potential to expose archaeological sites located along the river banks and compromise the site integrity and displace artifacts.

Without lodgepole treatments, fuel loads would continue to increase along with the risk of large-scale wildfire through the project area. Cultural resource sites that are vulnerable to fire would be damaged or destroyed. In particular, sites containing wooden features are very vulnerable to fire. Historic artifacts such as glass, wood, rubber, and other organic material are also easily damaged or destroyed by fire. Pre-contact sites containing lithic artifacts can be affected by extreme fire temperatures, especially obsidian artifacts. When subjected to temperatures exceeding 500^{o} C, obsidian loses moisture resulting in the elimination of the hydration bands, directly affecting the ability to perform obsidian hydration analysis.

Alternative B-Proposed Action

This alternative proposes to restore and buffer riparian areas along the river that have sustained damage from expanding recreational activities, improve hydrologic functions of the river and creating fish and Oregon spotted frog habitat, and evaluating and demolishing excess roads within the project area. These objectives will be met by thinning lodgepole pine from riparian meadows, decommissioning diversion ditches, placing instream structures to enhance hydrologic functions, rehabbing areas around dispersed campsites, and decommissioning or closing unauthorized roads. Table 26 describes the potential affects to cultural resources from the proposed project activities.

Table 26. Proposed Actions and Associated Ground Disturbance

Proposed Action	Description	Potential Disturbance
Riparian Restoration		
Placement of Instream Structures	Instream work by excavator: placement of tree structures (log jams), reshaping connections to side channels. Trees for instream structures will be taken within approximately 300' of the placement point. Trees would be tipped over with an excavator and moved to the placement site.	Water models indicate that placement of structures will cause flooding but not increased erosion. Uprooting trees and use of heavy machinery has the potential to cause ground disturbance.
Ditch Decommissioning	Reshaping an unauthorized water diversion from the point of diversion back to the river. This section of ditch would be contoured to match natural channel dimensions in the project area. The remaining section would be decommissioned and rehabilitated with riparian vegetation.	Area has been partially disturbed due to ditch placement and vehicle use. New ground disturbance is likely in areas where ditch is redirected back to the river.
Removal of Unauthorized Bridge	Removal of the unauthorized bridge at DS #14 over the Little Deschutes River and rehabilitation of the stream banks. Rehabilitation of this area would consist of planting of native sedges, rushes, and willows.	Minimal new ground disturbance due to previous disturbance from bridge placement. Planting will also cause minimal disturbance.
Meadow Restoration, Lodgepole Thinning	Remove encroaching lodgepole on meadow to restore areas back to early seral stage. Larger trees could be used as instream structures. Thinning will be done primarily by hand but trees selected to be used as instream structures will be removed with heavy equipment. Slash from thinning activities will either be treated through lop and scatter and/or piled for burning. A mesh fence is also proposed to protect a stand of aspen near DS #5.	Uprooting trees may impact archaeological sites by causing soil displacement. Hand thinning would have minimal impacts. Piling and burning slash could also impact cultural sites. Minimal ground disturbance will be needed to anchor fence posts near aspen stand.
Sustainable Transportation/Road Maintenance		
Road Decommission/ Closure	Ripping or subsoiling excess and/or unauthorized roads. Also bouldering or placing earthen barriers at the entry points for other roads that will remain intact but closed for most vehicle use. Road areas would also be rehabilitated by planting native vegetation, brushing, and placing signage stating closure.	Significant ground disturbance up to several feet in depth will be associated with subsoiling and ripping roads. Placing barriers at the entrances will create more localized disturbances varying in severity. Minimal disturbances from planting and sign placement.
Opening, Re-Designating User Roads	Administratively opening existing roads that have previously been considered closed or unauthorized. No improvements proposed but may be include maintenance activities.	Little to no disturbance as the road is already established. No on-the-ground action proposed apart from regular maintenance which has little potential to cause effects.
Reinforcing Closures	There are several locations throughout the project area where roads have been previously closed or	Varying levels of disturbance depending on treatment needs but

Proposed Action	Description	Potential Disturbance
	blocked off using earthen berms/barriers. If needed, these areas will be reinforced by recreating earthen barriers, placing boulders or other means of blocking access.	could be significant if new barriers are needed where they were not in place before.
Pullouts along Gulick Rd (FS Road 6125)	Heavy machinery will be used to create new pullouts along Gulick road to facilitate snowplow turnarounds and safe vehicle parking. Areas were chosen based on where minimal new ground disturbance would be needed.	New ground disturbance outside the current road prism. Area will be graded and leveled.
Road Signs	Placement of boundary signs at points where well-traveled roads (6125, 6100-100, and 5800-100) cross from Forest Service to private land and vice versa. Signs will be placed within the road prism.	Minimal ground disturbance within existing road prism.
Road Re-Route	Small re-routes have been proposed in the eastern portion of the northern section of the project area. These re-routes will be used to create a safer approach to the river that will also create less erosion overtime. The current route is a straight shoot that drops of a steep bench.	Heavy machinery will be used to create a gentler approach/switchbacks to the road along the river. Erosion control features will also be installed such as drainage dips.
Sustainable Recreation		
Redefine/Close Dispersed Recreation Sites	Sites proposed for redefinition would be pulled back from riparian areas and/or reduced in size due to resource or recreation impacts. Boulders, fences, logs, brush, or other materials would be utilized to redefine the sites and various unauthorized, non-historic structures would be removed. Native vegetation (willow stakes, aspen etc.) would be planted and native grasses utilized to re-seed areas. Signs and informational kiosks may also be installed (See Table 2 for more information).	Minimal ground disturbance will occur when pulling in slash and logs to redefine use areas from hand dragging material. Boulder placement will cause new ground disturbance if placed in previously undisturbed areas. The placement of signs, fencing, and planting will also have minimal impacts depending on placement. Potential impacts will increase if heavy machinery is used to perform any of these activities.
Removal of Unauthorized, Non-Historic Dump Sites (2 Total)	Remove dump items, close area, and rehab with native vegetation. Prior to removal check with the District Archaeologist.	Dump sites have been verified as non-historic. Minimal ground disturbance expected.
Interpretive Sign at Little Deschutes Cabin (DS #19)	Placement of an interpretive sign within the vicinity of the Little Deschutes Cabin (35KL 2868).	Ground disturbance will be limited to the placement of sign posts.
Fence at Little Deschutes Cabin (DS #19)	Placement of fencing to restrict motorized access to meadow and river.	Utilize buck and pole fencing to be placed by hand. No machinery use authorized.

Cumulative Effects

Cumulative effects on cultural resources were determined by focusing on the current aggregate effects of past, present, and reasonably foreseeable future actions. For cultural resources, in general, past actions have avoided effects to eligible or unevaluated cultural resource sites, because of the Forest Service responsibility to protect their values. In the past, the strategies of site protection or mitigation have been reasonably successful because of efforts to inventory, identify, evaluate, and manage cultural resources. Therefore, any overlapping past, present, or reasonably foreseeable action on this project would not intensify the effects expressed as direct or indirect.

Based on pre-disturbance surveys, a record search and field surveys of the Upper Little Deschutes Restoration project area, a finding of *"No Averse Effect"* was determined under Stipulation III(B)5 of the Programmatic Agreement. Project design features were developed in consultation with the Oregon State Historic Preservation Office. The majority of the activities proposed under this project will take place in areas where no cultural resources have been identified and, therefore, will have no effect on historic properties. However, some activities are planned within the vicinity of eligible or unevaluated cultural resources, particularly along the river. For the most part, these cultural resources will be avoided by ground disturbing activities, however, those activities that have little to no potential to impact cultural sites as outlined by the 2004 Programmatic Agreement will be allowed within site boundaries to enhance ecological health and minimize fuel loads. Project Design Features are included in Chapter 2.

Recreation

Overall, the proposed project will have beneficial effects to recreational resources within the project area. The proposed actions will maintain and enhance the existing values and benefits that the public and internal Forest Service employees expressed were on the landscape. Forest visitors will benefit from the restored dispersed camping sites and increased riparian and wildlife habitat. Management activities and increased presence will hopefully reduce and eliminate the illegal activities and resource damage that is occurring. The ULDR project area will continue to be the community of Crescent's backyard by providing quality, dispersed recreation opportunities.

Table 27. Summary Comparison of how the Alternatives Address the Purpose and Need

Resource Element	Resource Indicator (Quantify if possible)	No Action Alternative A	Proposed Action Alternative B
Dispersed Camping	1. Availability 2. Quality	1. Excellent 2. Adequate/Poor Doesn't address long-term sustainable recreation	Promotes sustainable recreation
Hunting: Camping and Hunting	1 .Availability 2. Quality	1. Excellent 2. Adequate Doesn't address long-term sustainable recreation	Promotes sustainable recreation
Dispersed hiking, walking, wildlife viewing	1. Availability 2. Quality	1. Excellent 2. Adequate Doesn't address long-term sustainable recreation	Promotes sustainable recreation
Dispersed motorized use	1. Availability 2. Quality	1. Adequate 2. Poor Doesn't address long-term sustainable transportation system	Promotes sustainable recreation and sustainable transportation system
Fishing	1. Availability 2. Quality	1. Excellent 2. Excellent Doesn't address long term sustainable recreation	Promotes sustainable recreation
Special Uses	Individual Basis	Adequate- currently meeting needs. NA—not tied to purpose and need	NA- not tied to purpose and need
Private property access	Individual Basis	Lack of consistent management. Doesn't address long-term sustainable transportation system.	Promotes sustainable transportation system

Existing Condition

Dispersed Camping

There are extensive opportunities for dispersed camping within the ULDR project area. This area is one of the lowest elevation camping destinations on the Crescent Ranger District, so depending on the winter, it can see year round use. There are 20 documented dispersed sites within the project area, most directly adjacent to the Little Deschutes River (see Table 1). These sites have no developed features (picnic tables, restrooms, designated sites, potable water, fire rings) and are not actively managed by the Forest Service. Some sites and man-made clearings appear to only be operating as

dumping areas. These are further identified as 'Dump' on the maps. It does not appear that any camping occurs within these areas, members of the public appear to just be leaving home garbage and other trash.

The existing dispersed sites appear to be providing adequate spaces for public need. Many of the sites are easily accessible and close to water. Campers utilize the water for cooking and cleaning as well as swimming in the summer months. Some of the sites, however, are seeing resource damage and expanding beyond a reasonable limit. Many of the sites have been expanded all the way to the river's bank, creating erosion. Additionally, in some sites there are evidence of trees being cut down and vegetation being damaged by motorized vehicles. Some of the sites also have become OHV play areas with 'donuts' and other damage from motorized vehicles. With this amount of expansion and resource damage, the quality of some of these sites are diminished. Instead of feeling like a camping spot, some of these have the appearance of a sand pit. There is a need to define these sites, clean them up, and increase presence to enhance their recreational quality. While some sites are in excellent condition, the majority of sites are adequate or poor quality because of the outlined issues.

Individuals or groups that camp on the National Forest for non-recreational purposes are referred to as 'residers'. They do not have another primary residence and regardless of how many days they stay, they are illegally residing (recreational campers are allowed to camp in one location for up to two weeks). Residers have been documented in the Upper Little Deschutes River project area throughout the year. The close proximity to town makes it appealable to people that still want to work and be near Crescent or LaPine. Forest Service law enforcement and field rangers make early contact with groups expected to be residing and inform them of Forest Service camping policy. For those residers that stay for extended periods of time in one spot can quickly cause extreme resource damage to the surrounding area. These groups often create toilets and other built structures out of the surrounding trees and vegetation and often leave behind large quantities of trash. This issue is not as prevalent on the Crescent Ranger District like it is on other neighboring district, however, one group can cause sustaining damage to a dispersed site (Note: residers are not assumed to be participating in other illegal activities. Many people are in the unfortunate situation of being temporarily homeless and are just attempting to find a place to stay).

Camping and Hunting-Availability

Similar to dispersed camping, there are excellent options for hunter's camps. Hunters are often seen occupying the majority of dispersed campsites during the fall season. Some hunting occurs within the project area, but many individuals camp along the Little Deschutes River and then hunt in other locations on the district. Hunting locations/units are dictated by Oregon State Department of Fish and Wildlife and are designated with specific seasons. Unless there is an extremely high amount of early season snow, most of the dispersed camping sites are snow-free and open during the hunting season. Most of the official campgrounds on the district and forest are closed during hunting season, so dispersed camping sites are the best options.

The existing sites appear to be providing adequate spaces for public need during hunting season. The ability to camp near water is extremely important when groups are staying for long stretches of time (often close to two weeks). Similar to dispersed camping, the sites are seeing resource damage and expansion. In some cases, multiple 'game poles[16] have been created in one location. Additionally, some hunting camps build temporary bathrooms and don't remove all the features when they leave. When these activities occur, the site no longer looks natural with all of the evidence of previous occupants (see DS #12). Many of these built features also include hunters/campers cutting and

[16] A small diameter tree stripped of branches and fastened between two trees to hang the carcass of game animals

removing trees around the campsite. This causes resource damage by removing natural vegetation and gradually increases the size of the site.

The Crescent Ranger District has healthy deer and elk populations. It has long been a favored area in Oregon State for multiple types of hunting seasons. The Little Deschutes River is a great location for hunters looking to be relatively close to amenities (gas, stores) while also near multiple hunting unit areas.

Hiking, Walking, Wildlife Viewing

There are no designated trails within the Upper Little Deschutes Restoration project area however, the ground is relatively flat with several access routes to the river providing great opportunities for hiking cross country, walking, and wildlife viewing. People hike cross-country, walk along the roads, or walk along old/decommissioned roads. Many locals can access the area from their private property. During the summer, this area sees light recreational-use, therefore visitors can experience nature without a significant human presence. The project area contains rich habitat types for a diversity of wildlife species (see Wildlife Resource Report). The riparian corridor is especially great for birding.

Current road densities and excessive motorized use can deter wildlife (especially deer and elk) from frequenting an area. Current off-road ATV/motorize damage is decreasing natural vegetation and therefore wildlife habitat. Sites along the river that lack riparian vegetation have less opportunities for wildlife viewing. Trash left behind by campers/visitors can be extremely harmful to wildlife species. Human trash and waste can cause wildlife to get sick or die and teaches certain species to be attracted to people.

Motorized Use

The project area has approximately 30 miles of open ML 2 Forest Service roads (see Transportation analysis for breakout). Some of these roads can accommodate passenger vehicles but they are maintained and managed for high clearance vehicles. There are no designated motorized trails within the project area, however, the Three Trails OHV area is near-by across Highway 58. Motorized use occurring includes passenger vehicles, residential traffic, 4x4 vehicles, OHVs (off-highway vehicles), and motorcycles. The project area's flat topography and often open landscape makes it easy to travel illegally cross-country or on old road beds.

There are no Forest Service bridges within the project area. There historically was a bridge in the northern section of the project area, where it is locally known as 'bridge out' –currently DS # 5 and 6 where a campsite and picnic spot is located. Some members of the public expressed interest in replacing the bridge for ease of access or winter use, others liked that it minimalized travel within the area with less 'through-traffic.' This alternative was considered but eliminated from further consideration due to the high cost, low usage (the crossing would be for dispersed snowmobiling or for local traffic off of private property, Chapter 2) and due to additional open roads a bridge is not needed for management or firefighting uses. There is also one unauthorized bridge at DS #14. It is unknown when the bridge was built but it appears to be providing OHV and snowmobile access from private land onto Forest Service land. This unauthorized route is causing resource damage to the river and riparian areas, especially in the wet riparian area to the west of the bridge, and it is unsafe. Forest visitors might assume the bridge is maintained by the Forest Service and not realize its limitations or risks. No weight bearing or safety inspections have been documented.

The current transportation system is not well marked and can be confusing for visitors. It is often unclear which roads are the Forest System Roads and which are unauthorized roads or old decommissioned roads. Many users unintentionally travel down closed roads and continue to expand them. Many roads (official and unauthorized) lead to sensitive riparian areas. Where there aren't

clear boundaries, motorized users drive in or near wet, riparian areas causing extensive resource damage. Even within dry portions of the project area, extensive illegal motorized use creates large non-vegetative openings and makes it nearly impossible for new vegetation to get established (DS #14 and 17 are prime examples). Illegal or unauthorized use that causes resource damage diminishes the experience for other forest visitors that want to appreciate the natural setting.

Fishing

The Little Deschutes River has numerous locations for fishing within the project area. Most sportsmen are fishing for brook or brown trout. Some popular fishing sites are near a road while others you need to walk into. Fishermen enjoy the area not only for sport but for the beautiful surroundings and wildlife viewing. Due to the area's light use, fishermen can find more secluded areas. The history of the area (including creating ditches and channeling the stream) has left negative impacts on stream health. In select areas where these past management actions are still present on the landscape, fish habitat is limited.

Special Uses

The two current special use activities occurring within the project area include firewood collecting and group site use at the historic cabin. Currently, the project area is open for roadside firewood collecting per the permitting process and Forest Firewood Synopsis. The Ponderosa Mountain Men have an annual rendezvous near the historic cabin within the southern section of the project area. This event highlights the use of black powder rifles and other historic outdoor practices. They utilize and camp at DS #19 under a special use permit authorized by the Forest Service. The dispersed camping area around the historic cabin is slowly expanding and diminishing the natural vegetation. Some redefining of the site could protect the natural resources and keep the site at its current size.

Private Property Access

The Forest Service manages a number of roads that provide access to private residential lands across both National Forest System lands and private lands where Forest Service has acquired a right-of-way. Forest roads are often bumpy, dusty and not designed or maintained for residential use. This would be the case for all of the roads located within the Upper Little Deschutes Restoration project area.

The Upper Little Deschutes Restoration project area is adjacent to many private land parcels. Private land owners have historically accessed their private property using various routes within this planning area that include travel across National Forest and other private lands, creating direct unauthorized routes onto their properties outside of an established road system. These direct routes have become primary access points onto their private property. Often times these access points are from a National Forest system roads (see Transportation Report).

Other values not explicitly evaluated

Personal Safety

Personal safety was a value expressed at the public values mapping meeting. Some members of the public expressed concern over camper and residers that were staying over the two week limit and potentially participating in illegal activities. This concern was immediately relayed to our Law Enforcement Officer and local Field Ranger (who is also a Forest Protection Officer). The Crescent Ranger District has increased its presence within the area and stays receptive to public concerns.

Winter Cross-country Skiing and Snowmobiling

There are no designated winter trails within the project area but there is some local use for cross country skiing and snowmobiling in the winter. It appears most, if not all, the activity occurs from local private property owners. Over-the-snow travel management (Subpart C) has not been

completed on the Deschutes National Forest. Under current Forest Service policy during the winter, recreationalist are allowed to travel over the snow "off-trail", as long as there is sufficient snow depth so they are not causing resource damage.

Environmental Consequences

Alternative A – No Action

If the No Action Alternative were selected, the existing condition would be perpetuating and potentially worsened. The current recreational opportunities could continue to cause resource damage and would not be sustainable to maintain. The reasons why visitors enjoy the area (natural beauty, wildlife viewing, and fishing) would diminish in quality.

Camping and Hunting

Without management and restoration, the existing dispersed camping sites would likely continue to expand and diminish the natural vegetation. Sites near the river would accelerate erosion and become more sandy and dusty. The natural beauty and primitiveness of the area would lessen. Trash often leads to more trash. If the existing trash and dump sites are not cleaned up, people will likely continue to leave garbage in them. Additionally, if there is no Forest Service presence, residers and people participating in potentially illegal activities may be more likely to occur as they believe they will not be bothered (Note: residers are not assumed to be participating in illegal activities. Many people are in the unfortunate situation of being temporarily homeless and just attempting to find a place to stay). This area could potentially become undesirable for people looking for a nice place to camp.

Hiking, Walking, Wildlife Viewing, and Fishing

Unmanaged and unsustainable recreational and motorized use could potentially impact the wildlife and riparian habitat. Wildlife viewing and fishing would decrease overtime as trash, erosion, and vegetation removal increased. High road densities would diminish the quality of habitat for many wildlife species. Animals in the area may become accustomed to eating and scavenging through human garbage, making them more likely to come in contact with people and their trash in the future.

Motorized Use

Damage from unauthorized trails would continue. More areas would turn into dusty sand pits preventing natural vegetation. Roads (unauthorized or system roads) near riparian areas would continue to cause sedimentation and negatively impact the riparian habitat. The current road system is poorly signed and visitors can easily get lost or inadvertently travel on unauthorized roads. Without creating a sustainable transportation system, visitors would continue to use unauthorized roads that are un-maintained and often causing resource damage. Additionally, the unauthorized bridge at DS #14 is a safety hazard to travelers in the area. The bridge has no weight or safety rating and could be potentially dangerous for users.

<u>Special Uses and Private Property</u>

The existing condition would remain.

Alternative B – Proposed Action

The proposed action consists of riparian enhancement, sustainable recreation, and sustainable transportation. Proposed activities were selected to maintain and enhance the existing values and benefits the landscape provides. The impacts of the proposed activities are recreation were addressed holistically, not separately

The Little Deschutes Cabin is a historic location utilized by organized groups for permitted events as well as by individuals and small groups for dispersed camping. Since the integrity of this structure is

still relatively good, installation of interpretive panels would be not only to share the history of the area but also to encourage its continued stewardship. Interpretation of the site would also increase public education and awareness of the Historic Preservation and the Archaeological Resource Protection Act (See Chapter 2 for a full description of the Proposed Action).

Direct and Indirect Effects

Dispersed Camping

The proposed activities will maintain and promote a natural, semi-primitive camping environment while still having an undeveloped feel, thus enhancing the quality of dispersed camping. Sites would be rehabilitated where necessary to allow for natural vegetation to regrow and reestablish. By defining sites with boulders or fencing, sites would no longer expand.

The implementation of the proposed riparian enhancement activities and instream work may temporarily displace campers, however, implementation will not occur across the project area at the same time. Campers would easily be able to find another suitable dispersed site in the area. Over the long run, the instream tree structures may have an indirect impact if the water level slightly rises around the features. This impact is expected to be minimal (0-2 foot change in water level). The proposed site refining with boulders or fencing would prevent people from camping in the potentially inundated areas directly adjacent to the river. The proposed action will bring the ULDR project area into compliance with Travel Management and Dispersed Camping guidelines stating that campers need to be at least 30 feet away from water bodies and streams (Travel Management ROD page 45).

The only sites that would be closed to motor vehicle access would be DS #8, DS #14, Dump #1, and Dump #2. Although DS #8 and #14 may have previously served as camp sites, they are currently operating as ATV sand pits. Once cleaned up and restored, visitors will still be able to walk through the site but not drive their vehicle. There is no evidence of camping at Dump #1 or #2. Increasing the Forest Service presence in the area will help curb misuse of dispersed camp sites (dumping, residing). It will also be necessary to ensure the site refining and bouldering remains in place. Within the last two years, the local field ranger has been more frequently visiting the ULDR project area. The District has already seen an improvement in the reduction of trash, dumping, and resource damage. People residing or camping longer than the two weeks limit are still likely to frequent the area due to the rising homeless population in central Oregon. The proposed action may not be able to prevent them from coming to the ULDR project area however it should minimize potential resource damage and impact to other campers.

The sustainable transportation proposed actions will still allow for access to all of the open dispersed camping sites. With less unauthorized roads and clearer signage, it may be easier for visitor to find a place to camp.

Camping and Hunting

Similar to effects on dispersed camping, the Proposed Action will have positive impacts to the quality of hunting and camping for hunters within the project area. The riparian restoration projects and site redefining will increase riparian vegetation and wildlife habitat in the project area. Hunters will be asked to limit the ‘game poles’ they create within a site and will be asked to remove any features when they leave the site. This will ensure that for years to come the campsites remain clean and natural looking.

The transportation plan was designed to provide adequate access across the project area and is not expected to impact hunting. If anything, the decrease in unauthorized roads may minimally improve wildlife habitat, especially for deer and elk. Effects to wildlife species can be found in the wildlife specialist report.

Hiking, Walking, Wildlife Viewing

The proposed activities will have minimal effects to dispersed recreation opportunities within the project area including hiking, walking, and wildlife viewing. Any unauthorized roads that are closed or decommissioned as part of the proposed action won't be drivable, however, will still be available for foot traffic. For those visitors that are looking for a quieter experience, they will be able to hike and walk on the closed roads without being interrupted by vehicle traffic. Proposed riparian enhancement and dispersed site restoration and refinement will have no impact on hiking, walking, or wildlife viewing. The restoration activities proposed may have an indirect effect to wildlife viewing as wildlife habitat increases over time. Additionally cleaner, trash-free sites will be more enjoyable for visitors in the area.

Motorized Use

Based on comments from the public meeting and scoping the transportation proposals were adjusted to accommodate popular travel routes as well as provide access across the project area and connect to the Gulick Road (6125 road). The Forest Service will update the Motor Use Vehicle Map as changes occur and will annually update the public on upcoming closures. Closures and road changes will likely be staged over multiple years as funding is available. The proposed action will prevent additional resource damage occurring from motor vehicles while also bringing the area in compliance with Travel Management guidelines (Travel Management ROD page 44). Future motorist will be able to more accurately tell where they are driving and which roads are open.

The unauthorized bridge at DS #14 will be removed as part of the proposed action. Removal of the bridge will ensure the safety of travelers in the area. Current users of the bridge (mostly local, near-by residents) will have to travel farther to cross the Little Deschutes River to access the same National Forest land via open ML 2 roads per the Motor Vehicle Use Map (MVUM). Although this may be inconvenient for a select number of individuals, it will stop the resource damage occurring at the bridge site and will provide for the safety of all forest visitors. The Forest Service does not allow the use of unauthorized, non-certified bridges on National Forest System land.

This project does not impact any designated over-the-snow trails. The change in the transportation system may impact local snowmobile riders who travel cross-country or over the unauthorized bridge. It can be difficult to tell if a road is closed when there is a high snowpack so they will need to exercise caution while riding off-trail. Riders utilizing the unauthorized bridge will need to find legal routes to cross the river, which may slightly increase their travel time.

Fishing

The Proposed Action will not preclude access to all documented fishing locations. The District recognized the importance of this treasured recreational opportunity and wants to maintain this activity in the area. Some of the dispersed sites will define how close people can park near the river. In some locations, fishermen may have to walk an additional 30-100 feet to access an existing site. The proposed riparian restoration and sustainable recreation proposed activities will increase riparian vegetation, enhancing riparian and fisheries habitats, and contribute to an overall healthier stream system. This will eventually create better quality fishing along the Little Deschutes River.

Special Uses

The public is allowed to purchase a permit and collect firewood off of Forest system roads per the Firewood Synopsis. None of the restoration treatments will yield additional firewood opportunities. With no direct or indirect effect, there are no cumulative effects to firewood.

The proposed action will maintain existing special use permitted activities within the project area. Ponderosa Mountain Men will be able to continue to enjoy the Little Deschutes River for their annual event. With the restoration and site refinement around the historic cabin, the site will be maintained and enhanced for years to come. Site refinement will not impact special uses within the area. With no direct or indirect effect, there are no cumulative effects to special uses.

Private Property Access

Unauthorized roads that traverse National Forest System lands and lead onto private property for the sole purpose of an access point or driveway would require an authorization. The Crescent Ranger District sent out two letters (4/07/17 and 8/29/17) requesting information from private landowners regarding access routes. The Crescent Ranger District Road Manager/Transportation Planner and Recreation and Lands Special Uses Permit Administrator met with numerous private landowners within the ULDR project area to discuss in detail their options (see Transportation Report) to ensure compliance with 36 Code of Federal Regulations (CFR) 251.50, Subpart B – Special Uses. Different scenarios may require additional options that will be evaluated on a case-by-case basis and any additional roads discovered would be considered unauthorized and decommissioned (with appropriate analysis by District specialists). There are no other past, present, or future activities that overlap in time and space with the ULDR project area that would have an impact on private property access (see Table 2 in Chapter 1 and the Transportation Report).

Cumulative Effects

The spatial boundary for cumulative effects to recreation resources is the ULDR project area on the Crescent Ranger District. Table 4 has been reviewed and there are no other past, present, or future activities that overlap in time and space with the ULDR project area that would have an impact on dispersed camping, recreation opportunities like hiking, walking and wildlife viewing, or fishing. Therefore there would be no cumulative effects.

Hunting could be impacted by the Crescent Roadside Firewood Strategy (2012) and Forest-wide Firewood (2017) occurring on the District. Having additional people present in the area and noise of chainsaws might cause the big game to move away from the area till the activity is complete. The scale of the ULDR proposed actions cannot be meaningfully measured to increase hunting quality or quantity. Overall with the closure of roads there should be a positive effect to hunting opportunities. Hunting is regulated by Oregon State Department of Fish and Wildlife, the Forest Service manages wildlife habitat on National Forest system lands.

Three Trails OHV project does not overlap the project area but is adjacent to the southwest corner of the Upper Little Deschutes Project. The Three Trails OHV area is still being built and developed, however, it currently offers ample opportunities to have off-road motorized experiences. An impact would be noise from the OHV/ATVs could be experienced by recreationists in the southern portion of the planning area or chainsaw use during construction of the Three Trails OHV trail system.

Soils

A full soils report is not necessary for this project because all of the proposed activities will convey a net benefit to the soil resource if the included project design features are followed. Each of the Action Alternatives will meet Deschutes National Forest LRMP S&Gs and Region 6 Soil Quality Standards, and honor the intent of the overarching policies and regulations applicable to the soil resource. The zone of influence is the ULDR project area.

Sensitive Soils

Certain soil types in the project area are considered sensitive soil types. Sensitivity is a measure of both a soil's resistance, or degree of response to disturbance, and its resilience, or ability to recover after disturbance. On sensitive soil types, the magnitude of impairment resulting from treatment impacts may be greater and expected recovery rates may be slower than on non-sensitive soils. If it is expected that healthy soil function may be diminished after disturbance, protection or restoration actions may be warranted when planning landscape treatments. The Deschutes National Forest LRMP (1990) provides guidance on soil types that must be considered sensitive in the planning process (Appendix 14, Objective 5, p. Appendix 14-2). Criteria for sensitive soils include: slopes over 30%, frost pockets, seasonal or year-long high water tables, fine sandy loam or finer surface textures that will compact, extremely rocky soils, and/or high or extreme erosion hazard ratings. Soil Resource Inventory (SRI) mapping units in the ULDR project area that are considered sensitive, along with concerns and opportunities for these soil types, are displayed in Figure 14 and Table 28 below. Deschutes LRMP guidance requires that the use of mechanical equipment be regulated in sensitive soil areas to protect the soil resource (LRMP S&G SL-5). Specific design criteria were developed for operations on sensitive soil types.

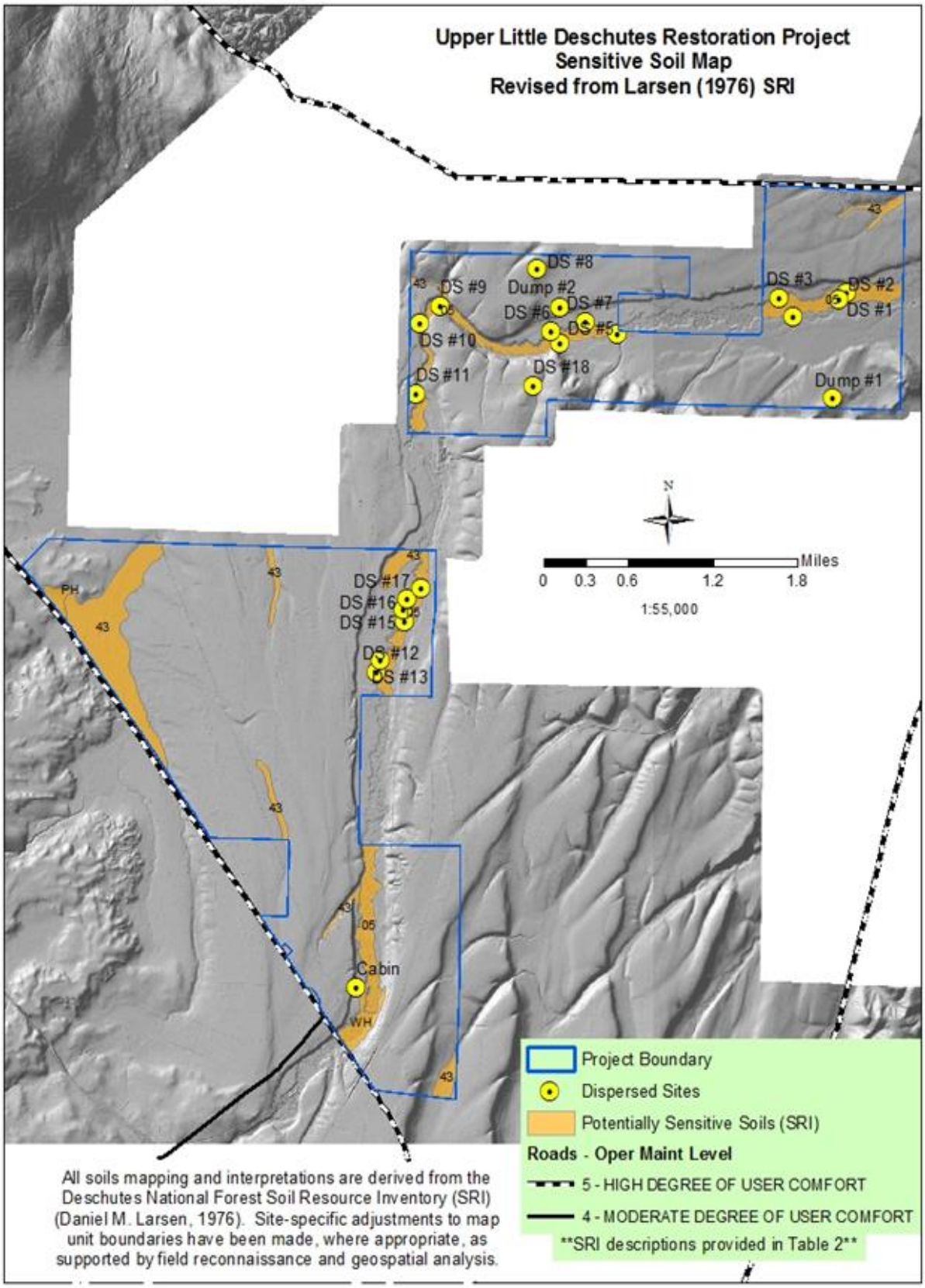

Figure 14. Sensitive Soils in the Upper Little Deschutes Restoration (ULDR) Project Area

Table 28. Sensitive Soil Types in the ULDR Project Area

SRI Unit	Description	Concern	Area Where Present	Total Acres in Project Area (% of Project Area)
5	Wet meadows	High water tables; unsuited for timber production	Floodplain of the Little Deschutes River	293 (5%)
15*	Lodgepole basins	High frost hazard limits regeneration success	Northwestern corner of southern block, along Highway 58	See complex PH below
43	Nearly level glacial outwash plains, commonly near drainages	High water tables, spring surface flooding ; high puddling/rutting hazard	Lower-lying landscape positions throughout project area	325 (5%)
PH (complex of 96 and 15)**	Nearly level glacial outwash plains with lodgepole basins	See SRI 15 above		15 (<1%)
WH (complex of SRIs 5 and 43)	Wet meadows and glacial outwash plains	See SRIs 5 and 43 above		33 (<1%)
Slopes over 30% not falling within another sensitive SRI Unit	Miscellaneous areas where slope exceeds 30 percent	High displacement and erosion hazard	Isolated areas along terraces	Negligible
TOTAL				**666 (11%)**

*Occurs only in complex, of limited extent in project area
**Complex mapping unit where only one component is a potentially sensitive soil type

Direct and Indirect Effects

Heavy equipment, passenger vehicles, and off-highway vehicles may displace, compact, and/or rut the soil. The removal of trees and other vegetation or displacement of surface layers can potentially cause adverse changes in organic matter levels. Damage to riparian soils can result in de-vegetation, erosion, and sediment contribution to streams. Conversely, de-compacting soils through ripping or subsoiling may decrease bulk densities, increase infiltration rates, and increase pore space. Planting native vegetation or adding surface cover increases soil organic matter, improves soil structure, stabilizes soil, and protects against wind and water erosion.

The proposed management activities include road system adjustments (road closures, road decommissioning, and adding roads to the system), tree removal (cutting of encroaching lodgepole and removal of trees to be used as instream wood), closing, restoring and defining dispersed recreation sites, restoration/repair of riparian and streambank damage, and revegetation/planting activities. Because the proposed treatment in the Action Alternative is largely focused on improving soil condition and function, the potential for increasing the extent of detrimental soil conditions in the project area is low. Most of the identified dispersed recreation sites would have their footprints defined and shrunk, while four sites would be closed to vehicular traffic and rehabilitated.

Cumulative Effects

The spatial boundaries for analyzing cumulative effects to soils are the actual activity areas/footprints of ground-disturbing actions proposed. Actions outside the activity boundaries would have little or no effect on soil productivity within the units, and actions within the activity boundaries would have little or no effect on soil productivity elsewhere. An activity area is defined as "the total area of ground impacted by an activity, and is a feasible unit for sampling and evaluating" (FSM 2520 and Forest Plan, page 4.71, Table 4-30, Footnote #1). The past, present, and reasonably foreseeable future actions listed in Chapter 3 of the EA have been reviewed, and there are no actions that overlap in time and space that would have an impact to soils. The cumulative soil disturbance incurred from those actions and the actions proposed in this project would not result in the exceedance of LRMP standards for soil detrimental condition, but would result in either no net change (where roads are closed, existing unauthorized routes are added to the system, encroaching lodgepole pine is removed, and wood placed instream) or in a meaningful increase in soil productivity and function (where roads are closed/decommissioned, where dispersed sites are defined, where dispersed sites and dump sites are closed/reclaimed, and where riparian areas and streambanks are repaired/restored).

Fire/Fuels

The Upper Little Deschutes Restoration project area is made up predominantly of lodgepole pine with some mixed ponderosa pine and a number of riparian and/or wetlands throughout. Dead and down debris can be found throughout the area as well. In the last 20 years there has been one large fire accounting for 1% of the total project area. This fire was caused by an escaped camp fire. In previous years around 30 % of the planning area was treated with pre-commercial thing (PCT) /underburning/thinning (BLT EIS 2009).

Direct and Indirect Effects

Alternative A

With no management activities occurring, the impacts on wildlife habitat, soils, water, forest health, public and firefighter safety would continue to increase. The only way that fuels reduction would occur is with a wildfire that under the No Action Alternative could be intense making suppression difficult and leading to damage and mortality across the project area.

Alternative B

This project intends to decrease the amount of lodgepole pine along the edge of the meadow for use as instream structure and decrease the number of dispersed campsites throughout. The proposed actions for this project include:

- Riparian enhancement and restoration; including slash from the lodgepole thinning would require either pile and burn, chipping or hauling off-site, and burning or actions listed in Chapter 2 will have no adverse effects on fuels.
- Sustainable recreation would provide recreational opportunities while reducing impacts to riparian and sensitive upland wildlife habitat. The action of closing dispersed campsites could lessen the threat of fire due to campfires.
- The placement of wooden structures in the river would have no effect on fuels.

Sustainable transportation creates a road system that provides public access throughout the planning area, provides for appropriate access to private lands. Fire and emergency ingress and egress, while increasing wildlife security and reducing the resource damage, vegetation removal, and sedimentation into the river. Closing roads has the potential to effect firefighting efforts, making it harder to access potential fires sooner by not possibly being able to drive to the fire but instead hike into the fire. This effect is small so will not affect fire and fuels.

Cumulative Effects

The Zone of Influence for fire and fuels is the project area. Table 4 has been reviewed for cumulative effects. The BLT EIS (2008) overlaps ULDR analysis area and is not fully implemented. All commercial harvesting from BLT has been completed and is part of the existing condition. Ongoing fuels treatments maintenance work, mowing/mastication or prescribed underburning to maintain the desired condition, associated with fuels reduction is continuing. Rim-Paunina EIS (2012) is still being implemented and none of the Rim-Paunina project area overlaps in time and space. Rim-Paunina units 3010 and 115 are separated from the south and southeast corner of the ULDR project area by 0.15 miles, but some effects may be overlapping. Effects that could be over lapping are from underburning. Underburning may cause smoke that would affect the ULDR project area. Burning would be conducted in compliance with National Ambient Air Quality Standards and under the Oregon Smoke Management Plan guidelines during all burning operations.

Climate Change

This proposed action would affect 244 acres of forest by thinning smaller lodgepole pine trees from the meadow near the river. This scope and degree of change would be minor relative to the amount of forested land as a whole. Climate change is a global phenomenon because major greenhouse gasses (GHG) mix well throughout the planet's lower atmosphere (IPCC 2013). Considering emissions of GHG in 2010 was estimated at 49 ± 4.5 gigatonnes[17] globally (IPCC 2014) and 6.9 gigatonnes nationally (US EPA 2015), a project of this magnitude makes an infinitesimal contribution to overall emissions. Therefore, at the global and national scales, this proposed action's direct and indirect contribution to greenhouse gasses and climate change would be negligible.

In addition, because the direct and indirect effects would be negligible, the proposed action's contribution to cumulative effects on global greenhouse gasses and climate change would also be negligible.

The Intergovernmental Panel on Climate Change (IPCC) has summarized the contributions to climate change of global human activity sectors in its Fifth Assessment Report (IPCC 2014). In 2010, anthropogenic (human-caused) contributors to greenhouse gas emissions came from several sectors:

- Industry, transportation, and building – 41%
- Energy production – 35%
- Agriculture – 12%.
- Forestry and other land uses – 12%

There is agreement that the forestry sector contribution has declined over the last decade (IPCC 2014; Smith et al. 2014; FAOSTAT 2013). The main activity in this sector associated with GHG emissions is deforestation, which is defined as removal of all trees, most notably the conversion of forest and grassland into agricultural land or developed landscapes (IPCC 2000).

The Upper Little Deschutes Restoration Project does not fall within any of these main contributors of greenhouse gas emissions. Forested land will not be converted into a developed or agricultural condition. In fact, forest stands are being retained and thinning is only along the river to preserve the meadow thus it will maintain a vigorous condition that supports trees, and sequesters carbon long-term for the remaining trees. Forest in the United States sequestered 757.1 megatonnes[18] of carbon dioxide after accounting for emissions from fires and soils in 2010 (US EPA 2015). However there is growing concern over the impacts of climate change on US forests and their current status as a carbon sink. There is strong evidence of a relationship between increasing temperatures and large tree mortality events in forests of the western U. S. There is widespread recognition that climate change is increasing the size and frequency of droughts, fires, and insect/disease outbreaks, which will have major effect on these forests' role in the carbon cycle (Joyce et al. 2014).

Although extremely small scale, the project is in line with the suggested practice of reducing forest disturbance effects found in the National Climate Assessment for public and private forests (Joyce et al. 2014). Here specifically, the project proposes to thin along the meadow edges to maintain the meadow characteristics and allow improved upland tree growth. The release of carbon associated with this project is justified given the overall change in condition increases forest resistance to release of much greater quantities of carbon from wildfire, drought, insects/disease, or a combination of these

[17] A gigatonne is one billion metric tons of CO_2; equal to about 2.2 trillion pounds.
[18] A megatonne is one million metric tons of CO_2; equal to about 2.2 billion pounds.

disturbance types (Millar et al. 2007). This project falls within the types of options presented by the IPCC for minimizing the impacts of climate change on forest carbon, and represents a potential synergy between adaptation measures and mitigation. Actions aimed at enhancing forest resilience to climate change by reducing the potential for large-scale, catastrophic disturbances such as wildfire also prevents release of GHG and enhances carbon stocks (Smith et al. 2014).

Timber management projects can influence carbon dioxide sequestration in four main ways: (1) by increasing new forests (afforestation), (2) by avoiding their damage or destruction (avoided deforestation), (3) by manipulating existing forest cover (managed forests), and (4) through transferring carbon from the live biomass to the harvested wood product carbon pool. Land-use changes, specifically deforestation and regrowth, are by far the biggest factors on a global scale in forests' role as sources or sinks of carbon dioxide, respectively (IPCC, Intergovernmental Panel on Climate Change 2000).

This is a restoration and not a timber management project. The Proposed Action ensures recreation is in a sustainable location that improves wildlife habitat effectiveness, improves the hydrological function and upland forest conditions thus it will increase vegetation (grasses, brush, and trees) along the river and increase the capacity to grow trees in the upland areas, which are positive factors in carbon sequestration.

Other Disclosures

Deschutes National Forest Land and Resource Management Plan

The Deschutes National Forest Land and Resource Management Plan of 1990 (LRMP) as amended, provides guidance for management activities. The LRMP establishes goals, objectives, standards, and guidelines for each specific management area of the Forest, as well as Forest-wide standard and guidelines. The LRMP identifies two management allocation within the project area – MA-9, Scenic Views and MA-8 General Forest where "There are opportunities for dispersed recreation activities, particularly those associated with roads. Informal camping and hunter camps are important use of the area…." This project is consistent with the standards and guidelines in the LRMP (4-117 and 4-121). In particular **M8-5-** *This Management Area will be managed to provide the recreation activity, setting, and experience of the Recreation Opportunity Spectrum category Roaded Natural or Roaded Modified.*

Roaded Natural- "Area is characterized by predominately natural-appearing environment with moderate evidence of the sights and sounds of humans…."

Roaded Modified- "The area is characterized by a setting that is heavily modified by human activity. Access is generally easy for highway vehicles…."

Upper Little Deschutes Restoration project is consistent with MA-9 for Scenic Views along Highway 58 as "*to the casual observer, results of activities either will not be evident or will be visually subordinate to the natural landscape."*

Northwest Forest Plan

This project is outside the Northwest Forest Plan boundary thus the 2001 Record of Decision and *Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* as altered by the 2011 Consent Decree and the May 13, 2014 Letter of Direction do not apply.

Executive Order 13112 (Invasive Species)

This 1999 order requires Federal agencies whose actions may affect the status of invasive species to identify those actions and within budgetary limits: "(i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species… (iii) monitor invasive species populations… (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded;…(vi) promote public education on invasive species… and (3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species… unless, pursuant to guidelines that it has prescribed, the agency had determined and made public… that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions."

There is a risk for spreading or introducing noxious weeds for the action alternative in this project. The risk is proportional to the area of ground disturbance used in the action alternative. The Region 6 Invasive Plant Final Environmental Impact Statement (FEIS) Record of Decision (USDA Forest Service, 2005) adopted Standards and Guidelines that would be followed to address this risk. Prevention is the overall objective, as described in the Project Design Criteria, Chapter 2.

Clean Water Act

The State of Oregon, as directed by the Clean Water Act (CWA) and the Environmental Protection Agency, is responsible for the protection of rivers and other bodies of water in the public interest. To show that water quality is being protected, states are required by the CWA to adopt water quality

standards which must be approved by the Environmental Protection Agency. Best Management Practices (BMP) and state-wide management plans are a requirement of the CWA and are used to meet water quality standards. The Little Deschutes River runs through both sections of this project area and is on the 2010 303(d) list for exceedances of stream temperature and dissolved oxygen (D.O.). Although there may be some short-term impacts (fine sedimentation) from felling, skidding, and placing the logs in the stream the long-term benefits include increased shade occurring as a result of improved soil moisture levels that can support riparian vegetation in a broader area, and improved shading as a result of riparian planting and the degree of shading provided by riparian plants such as willow, aspen, and sedge.

Clean Air Act

The proposed action is consistent with the Clean Air Act. There is the potential to dispose of cleared vegetation as a result of reconstruction activities by pile burning or hauling off-site and burning. The Forest Service, in cooperation with the DEQ, the Oregon Department of Forestry, and the Bureau of Land Management, has a Memorandum of Understanding (MOU) to establish a framework for implementing an air quality program in northeast Oregon. Any burning would be conducted in compliance with the State of Oregon Smoke Management System and would meet smoke management objectives for total emissions.

Wetlands and Floodplains

Executive Orders 11988 and 11990 direct Federal agencies to avoid, to the extent possible, both short-term and long-term adverse impacts associated with the modifications of floodplains and wetlands. Although there may be some short-term impacts to wetlands or floodplains (increased amounts of fine sediment delivery, and disturbance to riparian vegetation) from the felling and skidding of trees the long-term benefits of shallow groundwater elevation would be elevated (as a result of large wood placement and displacement of water) which would support riparian vegetation growth and the colonization/stabilization of disturbed surfaces. It is anticipated that implementation of this project would improve shallow groundwater storage, and therefore improve hyporheic exchange and restoration of a more natural (pre-European American disturbance) flow regime for this area.

Civil Rights and Environmental Justice

Civil Rights legislation and Executive Order 12898 (Environmental Justice) direct an analysis of the proposed alternative as it relates to specific subsets of the American population. The subsets of the general population include ethnic minorities, people with disabilities, and low-income groups. The proposed action would not pose any adverse effect to those populations as there would be no change in location, or services offered to all subsets of the public.

Prime Lands (Farm, Range, and Forest)

There are no lands within the boundaries of the Deschutes National Forest that meet the definition of prime farmland, or are considered prime farmland as discussed in the Deschutes LMRP. The Upper Little Deschutes project area is not considered “prime” forestland or farmland. This project, therefore, would not affect any prime lands.

Congressionally Designated Areas Such as Wilderness, Wild and Scenic Rivers, and National Recreation Areas

There are no Wilderness, Wild and Scenic Rivers, or National Recreation Areas within or adjacent to the project. The nearest Wilderness is Mount Thielsen Wilderness located approximately eleven and a half miles to the southwest of the project area. The nearest Wild and Scenic River is Crescent Creek approximately three miles to the northwest of the project area.

Inventoried Roadless Areas or Potential Wilderness Areas

There are no inventoried roadless areas in or near the project area. The nearest inventoried roadless area is Maiden Peak, located approximately ten miles to the northwest of the project area.

There are no Potential Wilderness Areas that meet the criteria of Forest Service Handbook 1909.12 Chapter 70 (71.1) within the project area. These two sections have been impacted with development including; buildings, roads, parking areas, tree removal, and other evidence of human activities precluding the area from being included in a potential wilderness inventory.

Agencies and Persons Consulted

RESOURCE SPECIALISTS:

Joan Kittrell –IDT Lead and District Wildlife Biologist
Paul Powers- Fisheries and Aquatics
Michelle King- Environmental Coordinator/Recreation (moved to Gifford Pinchot NF January 2018)
Carina Rosterolla- Wildlife Biologist
Sarah Hash- Soil Scientist
Lillian Cross- NEPA Writer/Editor
Christina Veverka- District Botanist
Starr Sullivan- Transportation Planner
Emily Pritchard- District Archaeologist
Kyle Wright- District Hydrologist
Robert Gentry- Recreation Team Lead (moved to Willamette National Forest March 2017)
Eric Amstad – Recreation Team Lead

FEDERAL, STATE, AND LOCAL AGENCIES:

Oregon Department of Fish and Wildlife
Oregon Department of Transportation
Oregon State Historic Preservation Office
United States Department of Fish and Wildlife Service

TRIBES:

The Klamath Tribes
Burns Paiute Tribe
Confederated Tribes of the Warm Springs Reservation

Other Interested Citizens

Bob Holland
Ben Sunderland
Matt Schwartz
Jayne Goodwin
Terry Simpson
Joni Mogstad
Beth and Norm Hatcher
Larry and Carolyn Roseberry
Eleanor Body
Jeff Wood
John and Janice Sakraida
Lane and Linda Thomas
Steve and Ruby Wirtz
Chad and Brandi Perkins
Doug Stumbach
Doug Heiken -Oregon Wild
Tim Cramblit
Rod Adams
Flynn Case
Gary & Vy Woodruff
Kevin Larson
Roger Clark
Robert Kissler